 Learners’ Preferences in ESP Instruction for Higher Medical Staff

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Abstract. The blended model of foreign language instruction in professional higher education has increased rapidly and amounts of research studies have proved that it can enhance the quality of learning English for Specific Purposes (ESP). However, not much has been discovered on how the blended model affects learning outcomes in higher education, of medical staff in particular. Therefore, the main objective of this pilot study is to analyze and consider students’ perception of blended model compared to the face-to-face course delivery, and their learning outcomes achievement.

The research was conducted at the Tertiary school for medical staff in Olomouc, Czech Republic, within the ESP course. Totally, the research sample included 86 first year students of various medical study programmes. Both forms of instruction, face-to-face and blended model, were implemented for 16 weeks, i.e. one semester. Data were collected via two written didactic tests. Students’ feedback on the blended learning mode was monitored by the questionnaire. They expressed higher motivation and appreciated traditional strengths, i.e. the possibility of individual pace and independence of study. They also demonstrated better learning outcomes in the test scores, despite no significant differences were discovered. However, the students with lower level of English performed slightly better in the group taught in the blended mode.

Keywords: English for Specific Purposes · ESP · Higher medical staff · Blended learning

1 Introduction

The implementation of blended model in foreign language instruction in higher education has increased rapidly and amounts of research studies have proved that it can also enhance the quality of learning English for Specific Purposes (ESP), e.g. [1, 2]. However, not much has been discovered on how the blended model affects learning outcomes in higher education, of medical staff in particular.

According to Shorey et al. research [3], in educating nurses and healthcare providers, integrating blended learning within the course enhances communication skills and improves self-efficacy among nursing students. Moreover, Halasa et al. [4] suggest
that the best teaching practices that create students taking the lead in the knowledge of
nursing, arise from other than the traditional model of learning.

So, the main objective of this paper is to present results of the research dealing with
learning ESP in higher medical staff from the view of students’ knowledge and feedback
on the blended learning model.

2 Theoretical Background

The process of acquiring new knowledge, skills, attitudes through appropriate learning
content and feedback, and reflecting learner’s individual needs and preferences, must
not be necessarily directly managed by the teacher. As generally accepted, the ICT-
supported learning is an educational technique characterized by self-paced, self-
administered instruction presented in logical sequence and with much repetition of
concepts Learner’s activities depend on how precisely defined learning objectives are,
on appropriate learning conditions, teacher’s proper knowledge of the learning process,
and last but not least, on the learning content [5].

The blended approach provides more flexibility for students and instructors. It
facilitates specific kinds of learning activities that might not be possible without the
technology, as presented e.g. by the SAMR (Substitution – Augmentation – Modification –
Redefinition) model [6], students activate different abilities and skills to build
new knowledge, and consequently, demonstrate what they learned. Last but not least,
both teachers and students have the opportunity to develop their skills in using latest
devices and applications. Considering a wide range of delivery methods, blended
learning is appreciated for the possibility to study using individually preferred learning
style and pace, as researched e.g. by Poon [7]. The experience in blended learning
proved that well-designed blended courses not only enhanced students’ learning towards
acquiring new knowledge but also increase the retention, even in large classes [8].

3 Research Methodology

3.1 Research Problem, Question, Objective

For numerous higher institutions, the blended model of instruction represents a con-
necting link between face-to-face and distance online courses. In the field of higher medical staff
preparation, hardly any research study has been conducted. The question is whether blended approach can enhance and support the process of ESP learning for medical professionals. Therefore, the main objective of this pilot study is to analyze and consider students’ perception of blended model compared to face-to-face course delivery, as well as their learning outcomes achievement.

3.2 Hypotheses

Six hypotheses were set to reach the research objectives.
1H₁: There are the statistically significant paired differences between results of pretest and posttest1 in group E.

2H₁: There are statistically significant paired differences between results of pretest and posttest2 in group E.

3H₁: There are statistically significant paired differences between results of pretest and posttest1 in group C.

4H₁: There are statistically significant paired differences between results of the pretest and posttest2 in group C.

5H₁: There are statistically significant paired differences between results of posttests1 in groups E and C.

6H₁: There are statistically significant paired differences between results of posttests2 in groups E and C.

To get p values, the exact or non-parametric tests should be applied [9], from two reasons: (1) a small number of samples in the data file (N = 46 in experimental group, N = 40 in control group), (2) the appearance of zero values in some data columns, which do not show the normality distribution (expressed by e.g. Shapiro-Wilk or Kolmogorov-Smirnov tests and required for the exploitation of parametric tests). The Wilcoxon paired exact test belongs to non-parametric tests and is used for processing the paired based comparisons. It works as an alternative to the parametric paired T-test in case of the normality of data distribution [10].

For testing hypotheses, a pair of a zero hypothesis \( H_0 \) and an alternative hypothesis \( H_1 \) were used. According to p value with regards to the significance level \( \alpha \), the zero hypothesis can be failed to reject (for \( p > \alpha \)), or the zero hypothesis can be rejected in favour of the alternative hypothesis (in case of \( p < \alpha \)).

Besides the \( p \) value, the achieved statistic results are supported by the effect size that confirms the strength of rejecting the zero hypothesis.

### 3.3 Methods, Tools, Sample

The comparative method was applied when focusing on data collected via didactic tests. All students stated they had not studied ESP for higher medical staff before, so, the entrance knowledge was not monitored but considered zero. The process of instruction took 16 weeks (one semester). The research was conducted at the Tertiary school for medical staff in Olomouc, Czech Republic, within the ESP course in the first year of study. Students were divided into two groups; group 1 (experimental group, E) consisted of 46 students and the blended model of instruction was applied. It means that students attended face-to-face lessons and received study materials and tasks for via LMS Moodle. Group 2 (control group, C), comprising 40 students, followed the traditional face-to-face lessons and LMS Moodle was not exploited at all in this group. All materials which were available in LMS for group 1 were provided in the printed form to them. In the middle of the semester (i.e. after eight weeks of instruction in the blended, or face-to-face manner) both groups sat for posttest1 (posttest1 in E group, posttest1 in C group) which monitored students’ knowledge. After another eight-week period, i.e. at the end of semester, posttest2 was administered (posttest2 in
E group, posttest2 in C group). Both the posttest1 and posttest2 consist of 70 tasks providing maximum score of 100 each. Active replies were required from the respondents; the tasks were not of multiple-choice type. Tests were assessed according to the following criteria: grade A: 100%–90% of maximum test score, B: 89%–79%, C: 78%–60%, F: 59%–0%.

Moreover, students of the experimental group reflected their opinions on the blended learning in the questionnaire. It included five areas of interest to provide the feedback, particularly focusing on students’ preference to face-to-face, or blended approach, other (which ones) subjects taught through blended learning would students appreciate, which type/s of study materials students consider the most useful, and which approach was more motivating for their learning were under the focus.

4 Research Results

Following the research design, results of testing six hypotheses are presented first, followed by the results of questionnaire collecting the feedback from students of the experimental group.

Using the techniques based on the quantitative research, the determined research problems, questions and objectives are confirmed in this contribution. Testing the hypotheses was generally and frequently used in this type of research complementing with descriptive statistics, e.g. boxplot. As one of the advantages of testing hypotheses, the guarantee of the statistical significance can be considered. Particularly, the paired comparisons of obtained results of the students’ improvement can be observed. For purposes of comparisons of appeared pretests and posttests, the paired tests are the appropriate option [10].

With regards to a normal probability distribution of data, parametrical or non-parametrical statistical paired test were exploited. In each testing the hypothesis or normality distribution of data, the obtained \( p \) value is compared to the declared statistical significance level. In the field of education, the applied significance level is 0.05. For purposes of the paired comparisons, the parametrical test Paired T-test should be used (for \( p \) greater than significance level) or the non-parametrical Wilcoxon paired test should be applied (for \( p \) lower than significance level) [10].

Data collected via didactic tests were processed by software PAST Statistics version 2.17 [11] and IBM SPSS Statistics, version 26.

4.1 Hypotheses 1H and 2H

The zero and alternative hypotheses were tested to compare the pretest and posttest1 scores and the pretest and posttest2 scores in the experimental group. Results of statistic testing are displayed in Table 1.

According to \( p = 3.51 \times 10^{-9} < \alpha = 0.05 \), the zero hypothesis \( H_0 \) is rejected in favour of the alternative hypothesis \( H_1 \). Therefore, there are the statistical significant paired differences between results of pretest and posttest1 in group E at the significance level \( \alpha = 0.05 \). Due to effect size \( r = 1 \), the rejecting the zero hypothesis was significantly proved.
According to \( p = 3.49 \times 10^{-9} < \alpha = 0.05 \), the zero hypothesis \( H_0 \) is rejected in favour of the alternative hypothesis \( H_1 \). Therefore, there are statistically significant paired differences between results of the pretest and posttest1 in group E at the significance level \( \alpha = 0.05 \). Due to effect size \( r = 1 \), the rejecting the zero hypothesis was significantly proved.

### 4.2 Hypotheses 3H and 4H

The zero and alternative hypotheses were tested to compare the pretest and posttest1 scores and the pretest and posttest2 scores in the control group. Results of statistic testing are displayed in Table 2.

**Table 1.** Results of testing hypothesis 1H – Paired Comparison between Pretest and Posttest1 in Group E and 2H – Paired Comparison between Pretest and Posttest2 in Group E.

|        | 1H: E Pre | 1H: E Post1 | 2H: E Pre | 2H: E Post2 |
|--------|-----------|-------------|-----------|-------------|
| Means  | 0         | 73.15       | 0         | 76.09       |
| Medians| 0         | 74.50       | 0         | 75.00       |
| \( p \) value: | \( 3.51 \times 10^{-9} \) | \( 3.49 \times 10^{-9} \) |          |             |
| Testing criterion \( W \): | 1081       | 1081        |           |             |
| Effect size - \( r \): | 1          | 1           |           |             |

According to \( p = 3.49 \times 10^{-9} < \alpha = 0.05 \), the zero hypothesis \( 2H_0 \) is rejected in favour of the alternative hypothesis \( 2H_1 \). Therefore, there are statistically significant paired differences between results of the pretest and posttest2 in group E at the significance level \( \alpha = 0.05 \). Due to effect size \( r = 1 \), the rejecting the zero hypothesis was significantly proved.

**Table 2.** Results of testing hypothesis 3H – Paired Comparison between Pretest and Posttest1 in Group C and 4H – Paired Comparison between Pretest and Posttest2 in Group C.

|        | 3H: C Pre | 3H: C Post1 | 4H: C Pre | 4H: C Post2 |
|--------|-----------|-------------|-----------|-------------|
| Means  | 0         | 66.09       | 0         | 68          |
| Medians| 0         | 69.50       | 0         | 69          |
| \( p \) value: | \( 3.49 \times 10^{-9} \) | \( 3.49 \times 10^{-9} \) |          |             |
| Testing criterion \( W \): | 1081       | 1081        |           |             |
| Effect size - \( r \): | 1          | 1           |           |             |

According to \( p = 3.49 \times 10^{-9} < \alpha = 0.05 \), the zero hypothesis \( 3H_0 \) is rejected in favour of the alternative hypothesis \( 3H_1 \). Therefore, there are statistically significant paired differences between results of the pretest and posttest1 in group C at the significance level \( \alpha = 0.05 \). Due to effect size \( r = 1 \), the rejecting the zero hypothesis was significantly proved.

According to \( p = 3.49 \times 10^{-9} < \alpha = 0.05 \), the zero hypothesis \( 4H_0 \) is rejected in favour of the alternative hypothesis \( 4H_1 \). Therefore, there are the statistically significant paired differences between results of the pretest and posttest2 in group C at the significance level \( \alpha = 0.05 \). Due to effect size \( r = 1 \), the rejecting the zero hypothesis was significantly proved.
4.3 Hypotheses $5H$ and $6H$

The zero and alternative hypotheses were tested to compare the pretest and posttest1 scores and the pretest and posttest2 scores in the experimental and control group. Results of statistic testing are displayed in Table 3.

Table 3. Results of testing hypothesis $5H$ – Paired Comparison between Posttests1 in Groups E and C and $6H$ – Paired Comparison between Posttests2 in Groups E and C.

|               | $5H$: E Post1 | $5H$: C Post1 | $6H$: E Post2 | $6H$: C Post2 |
|---------------|---------------|---------------|---------------|---------------|
| Means:        | 73.15         | 66.09         | 76.09         | 68            |
| Medians:      | 74.50         | 69.50         | 75.00         | 69            |
| $p$ value:    | $7.41 \times 10^{-9}$ | $3.18 \times 10^{-9}$ |
| Testing criterion $W$: | 1029         | 1081          |               |               |
| Effect size - $r$: | 0.95         | 1             |               |               |

According to $p = 7.41 \times 10^{-9} < \alpha = 0.05$, the zero hypothesis $5H_0$ is rejected in favour of the alternative hypothesis $5H_1$. Therefore, there are the statistical significant paired differences between results of the posttests1 in groups E and C at the significance level $\alpha = 0.05$. Due to effect size $r = 0.95$, the rejecting the zero hypothesis was significantly proved.

According to $p = 3.18 \times 10^{-9} < \alpha = 0.05$, the zero hypothesis $6H_0$ is rejected in favour of the alternative hypothesis $6H_1$. Therefore, there are the statistically significant paired differences between results of the posttests2 in groups E and C on the significance level $\alpha = 0.05$. Due to effect size $r = 1$, the rejecting the zero hypothesis was significantly proved.

4.4 Students’ Feedback on Blended Learning

Students expressed their opinions on blended learning through the questionnaire. The results show that:

- 96% of 46 students preferred the blended approach;
- 79% would appreciate to have blended learning in other subjects as well, particularly in Anatomy and Physiology (21%), Pharmacology (10%), Chemistry (9%), Pharmacognosy (4%), Latin language (2%) and others;
- some types of study materials were considered very useful for learning: video-recordings (21%), grammar exercises (18%), vocabulary exercises (14%), extra study materials providing texts with extra or more detailed information about the related topic, links to such materials, sometimes also extra exercises, labelling pictures, reading comprehension etc. (7%), topic revision in Czech language (6%), links to dictionaries (2%);
- blended approach (62%) was more motivating to self-study for the students compared to the face-to-face learning (21%), both modes were also appreciated (17%).
5 Summary and Conclusion

To sum up, students reported significantly higher preferences in the blended model of the course in comparison to the face-to-face lessons. After studying in the blended model, they expressed higher motivation and appreciated traditional strengths, i.e. the possibility of individual pace and independence of study. They also demonstrated better learning outcomes in the test scores, despite no significant differences between the groups were discovered. However, the students with lower level of English performed slightly better in the group, which was presented with the blended model.

Both course delivery approaches examined in this pilot study proved themselves efficient in today’s higher education. The authors believe that the traditional course delivery will continue to offer benefits that cannot be fully obtained in any other formats. Nevertheless, blended instruction does not appear to impair students’ performance and it might enhance their appreciation of the concepts in some cases. Students in the blended learning group indicated they would definitely take another course using this method. Moreover, this delivery format offers increased flexibility to both students and teachers, who can operate from home not only in cases like the corona virus crisis, which we are experiencing right now.

Research results were analysed using the quantitative research including the testing the hypotheses and descriptive boxplot (displayed in Fig. 1). The data show that starting from no knowledge at the beginning of the research period, they significantly improved in posttest1 which was administered in the middle of the semester. However, hardly any increase can be detected at the end of the period (+2.94). Nevertheless, the increase in pair scores in the experimental group compared to the control one in posttest1 is statistically significant (+7.06, Table 3), as well as in posttest2 (+7.541, Table 3).

The fact that students reach higher cognitive increase when the process of instruction is supported by information and communication technologies, i.e. in blended learning, is also proved by these research results.
Moreover, as clearly seen from the feedback questionnaire, test scores and numerous studied conducted in the past, higher medical students also appreciated traditional positive characteristics of blended learning, i.e. the face-to-face contact with teachers and at the same time the possibility to study any time, any place, any pace, as displayed in results of questionnaire. These features refer to learning general English and ESP. However, as ESP for higher medical staff does not appear frequently in the study programmes, the contribution of this study is high. As the principles of ESP teaching/learning are identical, the discovered findings can be applied in engineering study programmes.

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