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# CLICKER SYSTEMS AS A SMART TECHNOLOGY-BASED TOOL FOR TEACHING ENGLISH TO MASTER'S STUDENTS MAJORING IN PUBLIC ADMINISTRATION

**Abstract.** This study experimentally verifies how the ESP learning environment supported by the use of clickers influences learners' academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, functioning of a dominant brain type, and performance in learning English for specific purposes. This research relies on mixed methods and focuses on clickers like Kahoot and Socrative. The entry and outcome data were obtained through Rasch's measurement model that was used to measure academic motivation, Byrne and Matotti-designed academic confidence measurement techniques used to measure academic self-efficacy, Frederick's methodology for diagnosing cognitive reflection and decision making, a comprehensive ESP test consisting of the listening, reading, speaking and writing sections and Attitude/motivation test battery to measure shifts in the functioning of the students' dominant brain type used to perform them. Those measurements were considered as dependent variables for this study. At the post-experimental stage, both a focus-group semi-structured interview and numerical and qualitative data analyses were carried out to validate the statistical significance of the experiment outcomes. Furthermore, a two-way ANOVA was used to define the dependence of the above-mentioned variables on the use of clickers. The data processing procedure relied on the application of free Two-Way ANOVA Statistics Software (Calculator) for non-commercial (academic) use. The responses of the focus group participants were processed under the guidelines for focus group research. This study found that integration of clicker systems as a type of smart technology into teaching English for Specific Purposes to Master's Degree students majoring in Public Administration (in civil protection) is effective, as it triggers the students' desire to learn, creates a relaxed environment, develops students' cognitive sphere, and enhances students' academic performance. Additionally, the results of the experiment suggest that due to clickers, language learning turns into a challenging experience allowing students to consolidate their knowledge and master their skills in information search and processing. The paper states that this teaching approach is student-centered, which reduces the teacher's dominance and gives way to the student's autonomy.

**Keywords:** smart technologies; English for Specific Purposes; Master's Degree students majoring in Public Administration; clicker systems

## 1. INTRODUCTION

**Statement of the problem.** The integration of smart technologies into the teaching of English for Specific Purposes (ESP) to those undertaking either undergraduate or postgraduate study in tertiary schools has been used as a way to upgrade the content and teaching methods, as well as enhance learners' motivation and boost learning outcomes for two recent decades [1], [2]. Other advantages of the use of smart technologies in teaching ESP are the opportunity for students to experience new strategies to learn the specialism-related language content and to meet their own needs, to get engaged in learning activities, and to enjoy learning, as smart technology usually uses gamification elements [3]. Additionally, it corresponds to the concept and instructional principles of ESP [4]. It has changed the ways the educators explore educational concepts that provide convenience,

 

drastically changes students' learning experience, and increases student engagement in the learning process. The above suggests that adopting smart technology in teaching ESP can be considered to be a pedagogic solution that is time-efficient, easy-tailored, flexible, affordable, easy-scalable, and adjustable to anyone's intellectual style or learning pace, and it shows good potential to increase the quality of the ESP teaching.

**Analysis of recent research and publications.** There exists an extensive body of research investigating the application of technology for the formation of various language and speaking skills when teaching ESP [5], [6], and the use of smart technologies in the settings of ESP learning environment [6], [7], [8]. Those scientific works either advocate or challenge their effectiveness in terms of meeting learning objectives and outcomes. Some ESP-teaching-related studies revealed the influence of smart technology on cognitive and creative spheres of a person [9]. A number of studies prove that the use of smart technology in a lesson can increase time-efficiency and students' engagement, provide students with a more gamified and more authentic learning environment, and improve class management making a shift to collaboration and interaction based on students' responsibility for their results and individual learning styles [10], [11], [12], [13], [14].

Clicker systems or audience response systems (ARS) or electronic voting systems are increasingly used in traditional teaching as a tool to engage and assess students, to diversify their learning experience [15]. There are several examples of them, which are as follows: *Acadly* (https://www.acadly.com) is found by instructors to be a helpful tool to design and deliver engaging lectures, and keep records of attendance; *Mentimeter* (https://www.mentimeter.com/) is an interactive presentation platform for real-time presenter-participant interaction; *DialogLoop* (https://dialogloop.com) is proven optimum for the teachers who run real-time surveys, engage students in live question-answer sessions, and interact with students through live private chatting and networking; *Verso* (http://versolearning.com/) is used to create virtual learning environment; *Kahoot* (https://kahoot.com/) allows teachers to create quizzes and surveys; *Socrative* (https://socrative.com/) is for both collaborative and self-paced learning.

From the instructional perspective, the value of using clickers is as follows: they prompt deeper thinking towards a particular question; enable real-time classroom management (students are monitored and given instant feedback); and spark discussions to reason or justify the participants' views [16].

**Identified research gap.** The clickers are widely used in teaching Social Studies, Business Studies, Engineering [6] but there have been few studies dedicated to the use of clickers in the ESP teaching, specifically, the relation between the use of the clicker systems and the Brain-based Learning Approach [17].

**Research purpose.** Considering the above as reasoning, the purpose for this study was to experimentally test how the ESP learning environment supported by the use of clickers influences learners' academic motivation, academic self-efficacy, cognitive reflection and speed of decision making, dominant brain type, performance in listening, reading, speaking and writing skills trained in the ESP course.

## 2. THE THEORETICAL BACKGROUND FOR THIS RESEARCH

This study relies on several might-be-connected theoretical concepts like CLIL (Content and Language Integrated Learning) [18], a pedagogic use of the clicker systems [15], gamification in instruction [19], Bring Your Own Device (BYOD) policy [20] and Brain-based Learning Approach (BBLA) [21]. We are confident that the convergent use of the above can both empower the teacher with a potentially better teaching instrument capable of increasing alertness, ensuring both organised immersion and active information processing,

and bringing positive change to students' cognitive, behavioural, language and academic self-efficacy domains [22]. This research was inspired by the easy-to-adjust nature of technology, which fits the principles of teaching Languages for Specific Purposes and the CLIL approach to teaching Languages (Linguistics) at tertiary schools. It also relies on the principles of the concept of authenticity in the study of foreign languages, which is associated with the use of language produced by a native speaker orally or in writing [13].

## 3. METHODS

This research relies on the methods used for mixed methods studies, as it was intended to analyse the impact that the clickers like Kahoot and Socrative have on the sampled students' academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, functioning shift of certain brain type dominance, performance in the English language listening, reading, speaking and writing skills. The entry and outcome data were obtained through Rasch's measurement model that was used to measure academic motivation [23], Byrne and Matotti academic confidence measurement techniques [24 modified by Sachitra and Bandara] used to measure academic self-efficacy, Frederick's methodology [25] for diagnosing cognitive reflection and decision making, a comprehensive ESP test consisting of the listening, reading, speaking and writing sections and Attitude/motivation test battery [26] to measure the functioning shift of certain brain type dominance. Language skills, academic motivation, academic self-efficacy, cognitive reflection and decision making, and functioning shift of certain brain type dominance were the dependent variables for this study. Secondary data like the teacher's observations were also used to increase the validity of this investigation. At the post-experimental stage, a focus-group semi-structured interview and a numerical and qualitative data analysis were carried out to validate the statistical significance of the experiment outcomes. Furthermore, a two-way ANOVA was used to define the dependence of the above-mentioned variables on the use of clickers. The two-way ANOVA relied on the application of free Two-Way ANOVA Statistics Software (Calculator) for non-commercial (academic) use [27]. The responses of the focus group participants were processed under the guidelines for the focus group research [28].

Overall, this was a quasi-experimental research of pre-test–post-test design conducted under the natural conditions of the educational process. The research took all the year of 2019 through with half a year spent on the experimental stage. The prior- and post-experimental stages lasted approximately between two and three months each. The first stage (a prior-experimental stage) was dedicated to literature and best practices review to identify a research gap, work out the research design and design the materials to be ready for uploading at Kahoot and Socrative resources and sampling (pre-testing). The experimental stage involved the ESP course delivery to the experimental and control groups and data collection through post-testing. At the post-experimental stage, the data were analysed, consolidated, and interpreted to make conclusions (see the research design visualised in Figure 1).

The research relied on a two-stage cluster sampling considering the fact that the students obtaining education in the same field of specialism could be mutually homogeneous. Two academic groups of 20 (13 females and 7 males aged between 28 and 35) and 20 (12 females and 8 males aged between 27 and 41) students seeking a Master's degree in Public Administration were purposefully sampled for this experiment. At the second stage of sampling, the entry measurements of academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, dominating brain type, performance in listening, reading, speaking, and writing were performed using the above-mentioned tests. The results of measurements are presented as tables (see mean values in Tables 1, 2, 3, 4, 5, 6).

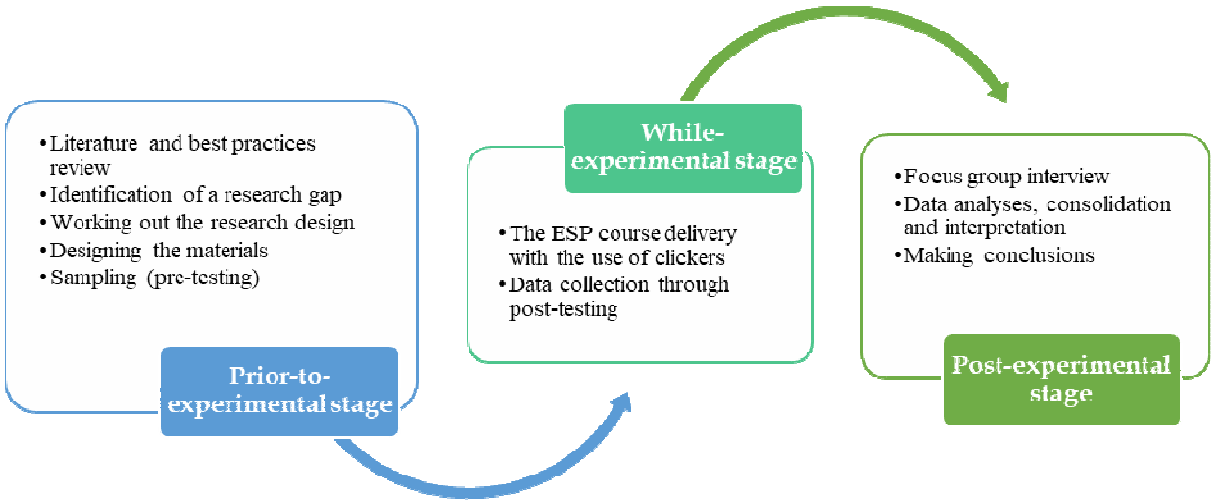


*Figure 1. The research design visualised*

Suggesting that the values for academic motivation varying between $-2 < x < +2$ are acceptable, results are presented in Table 1 with the residual figures being 1.21 for the CG, and 1.19 for the EG are statistically significant. Even though the figures seemed to fit the Rasch's model, attitudinal aspects of personal incentives tended to be the lowest while behavioural features of desire to learn reached their high of 0.61 in the CG and 0.63 in the EG. In Table 2, the figures for the level of academic self-confidence measured with a five-point Likert scale were almost similar in both groups (EG – 3.30 and CG – 3.33). Judging by the mean values for cognitive reflection that are presented in Table 3, both groups performed approximately equally (EG – 1.52 and CG – 1.51). In Table 4, the mean values for the type entitled "Determined by the foreseeable consequences" appeared dominant. It was noteworthy that in both groups right-brain type dominated, which meant that the participants with better-developed imagination, emotional intelligence, and creativity were a larger proportion than the other types, which seemed a disadvantage for learning a foreign language (see Table 5). The grades for the ESP test administered in both groups were also approximately similar. The majority of the students had grades between 70 – 79 (ECTS), which was acceptable for this study (see Table 6).

*Table 1.*

**Mean values obtained through the Rasch's measurement model to measure academic motivation**

| Groups | Aspects of motivation | | | | | | *Chi Sq.* | Probability | *SE* | Residual |
|---|---|---|---|---|---|---|---|---|---|---|
| | *SP* | | *DL* | | *PI* | | | | | |
| | A | B | A | B | A | B | | | | |
| EG, $n = 20$ | *- 0.68* | *0.47* | *- 0.43* | *0.61* | *- 0.86* | *0.42* | 8.68 | 0.67 | 0.05 | *1.21* |
| CG, $n = 20$ | *- 0.70* | *0.46* | *- 0.42* | *0.63* | *-0.88* | *0.39* | | | | *1.19* |

***Note:*** SP - *Striving for Perfection* (standards, goals, objectives, efforts, values, and capabilities); DL - *Desire to Learn* (interest, learning from others and being responsible for their learning); PI - *Personal Incentives* (external, internal and social benefits); A - *attitude difficulties*, B - *behavioural difficulties*.

*Table 2*

**Mean values obtained through the administration of Byrne and Matotti-designed academic confidence measurement techniques**

| Groups | The mean value for student responses (a five-point Likert scale) | *SD* | Cronbach's alpha | *p*-value | Average level of academic confidence, % | |
|---|---|---|---|---|---|---|
| | | | | | Yes | No |
| EG, $n = 20$ | 3.33 | *.948* | 0.791 (> 0.7) | <0.05 | 62 | 38 |
| CG, $n = 20$ | 3.30 | *.945* | | | 61 | 39 |

*Table 3*

**Mean values obtained through the cognitive reflection measurement**

| Groups | *The average indicator for the results of the diagnosis of cognitive reflection* | *Low level* | | *High level* | |
|---|---|---|---|---|---|
| | | *0* | *1* | *2* | *3* |
| EG, $n = 20$ | 1.52 | 25% | 25% | 25% | 25% |
| CG, $n = 20$ | 1.51 | 23% | 26% | 27% | 24% |

*Table 4*

**Mean values from decision-making diagnostics**

| *Decision type* | *Low level of cognitive reflection* | | *High level of cognitive reflection* | | *Statistical significance* |
|---|---|---|---|---|---|
| | *EG* | *CG* | *EG* | *CG* | |
| Impulsive | +1.01 | +1.02 | -0.21 | -0.23 | $p < 0.001$ |
| Delayed | +1.05 | +1.07 | +1.06 | +1.08 | n.s. |
| Determined by the foreseeable consequences | +2.49 | +2.47 | +1.64 | +1.59 | $p < 0.01$ |
| Determined by hesitation | -1.16 | -1.15 | +0.11 | +0.13 | $p < 0.01$ |

*Table 5*

**Distribution of brain type dominance in both groups**

| Brain type | $n$ | Mean | $SD$ | $t - value$ | $p\ value$ | Significance level |
|---|---|---|---|---|---|---|
| Right | 18 | 24.53 | 4.32 | 11.5 | .06 | $p \geq 0.05$ |
| Middle | 10 | 25.77 | 4.92 | 9.52 | .05 | $p \geq 0.05$ |
| Left | 12 | 24.40 | 4.81 | 9.49 | .02 | $p \geq 0.05$ |

*Table 6*

**Mean values in the ESP test administered in the EG and CG, %**

| Group | Grades (ECTS) | | | | $df$ |
|---|---|---|---|---|---|
| | 60-69 | 70-79 | 80-89 | 90-100 | |
| EG, n=20 | 14% | 64% | 16% | 7% | 1 |
| CG, n=20 | 12% | 62% | 18% | 8% | 1 |

A *t-test* based on the mean values of the diagnostic tests listed above was conducted to determine if there were any statistically significant differences in the EG and CG (see Table 7).

*Table 7*

**T-test results based on the mean values of the above listed diagnostic tests conducted in both groups**

| Groups | Estimated parameters | | | | |
|---|---|---|---|---|---|
| | $M$ | $SD$ | $SE$ | $t-test$ | $p$ |
| EG, $n = 20$ | 3.4221 | 1.12243 | 53 | 0.72 | 0.461 |
| CG, $n = 20$ | 3.3249 | 1.11381 | | | |

**Note:** $p$<.05; $n$ – the number of students; $M$ - arithmetic mean; $SD$ – standard deviations; $SE$ – standard error.

As can be seen in the table above, the results of pre-intervention measurements for both groups were approximately the same, which meant that they were homogeneous, they could participate in the experiment, and the experimental results could be considered statistically significant.

Seven EG students were randomly sampled for the focus group interview based on four open-ended questions (see them further).

Both groups were taught the same topics (see Table 8). While the CG sampled students were receiving traditional training, the EG sampled students were trained in ESP with the use of clickers, namely Kahoot and Socrative.

*Table 8*

**A brief outline of the topics delivered through the clickers Kahoot and Socrative to both groups (EG & CG) and the number of questions for each topic**

| # | Topic | Number of questions | Clicker systems | |
|---|---|---|---|---|
| | | | Kahoot | Socrative |
| 1. | Public Administration as an academic discipline and social science | *17* | ✓ | ✓ |
| 2. | Business Management and Public Administration | *13* | ✓ | ✓ |
| 3. | Bureaucracy | *10* | | ✓ |
| 4. | Public Policy | *11* | ✓ | ✓ |
| 5. | Levels of Government | *11* | ✓ | ✓ |
| 6. | Non-profit organizations | *8* | | ✓ |
| 7. | The European Union | *8* | ✓ | |
| 8. | Communicating in an emergency | *10* | ✓ | |
| 9. | Decision-making in an emergency | *11* | | ✓ |
| 10. | Emergency response planning: key aspects | *9* | | ✓ |
| 11. | Managing search and rescue operations | *10* | ✓ | ✓ |

Semi-structured interview questions for the focus-group students ($n = 7$ people) included 4 open-ended questions which were as follows:

1. What were your impressions of participation in the ESP course using Kahoot and Socrative? Suggest your reasoning for positive or negative feelings.

2. Was the course useful for your career as a specialist in Public Administration (in civil protection)? Suggest your reasoning.

3. Would you recommend such a course to your peers? Why?

4. What, do you think, could make this programme more useful for the students? Suggest your reasoning.

## 4. FINDINGS

The ESP learning environment supported by the use of clickers proved to have an impact on the sampled students' academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, dominant brain type, performance in listening, reading, speaking and writing skills trained in the ESP course.

Before presenting the results of the *t-test* based on post-experimental measurements, we found it appropriate to provide the data illustrating the EG students' performance in using Kahoot and Socrative clickers (see Table 9).

*Table 9*

**The EG students' performance in using Kahoot and Socrative**

| Topic | Answers in total, % | | Average scores | | Time response, sec. | |
|---|---|---|---|---|---|---|
| | CA | IA | K | S | Per CA | Per IA |
| 1 | 51.78 | 48.22 | 3039 | 2172 | 7.2 | 8,4 |
| 2 | 58.91 | 41.09 | 3244 | 3334 | 6.3 | 7.3 |
| 3 | 62.12 | 37.88 | – | 4436 | 6.1 | 6.8 |
| 4 | 67.32 | 32.68 | 3287 | 3605 | 5.7 | 6.2 |
| 5 | 69.76 | 30.24 | 3922 | 3491 | 5.1 | 5.9 |
| 6 | 68.22 | 31.78 | – | 5737 | 4.8 | 5.7 |
| 7 | 70.27 | 29.73 | 6749 | – | 4.2 | 5.3 |
| 8 | 77.19 | 22.81 | 7178 | – | 3.9 | 4.9 |
| 9 | 77.81 | 22.19 | – | 8273 | 3.7 | 4.3 |
| 10 | 87.10 | 12.90 | – | 8684 | 3.3 | 3.9 |
| 11 | 88.73 | 11.27 | 5278 | 5085 | 3.1 | 3.3 |

***Note*:** K – *Kahoot*; S – *Socrative;* CA – *correct answer*; IA – *incorrect answer.*

It was noteworthy that the time response per both correct and incorrect answers decreased with time. Surprisingly, students' time response for incorrect answers was longer than in case of the correct answers.

The above was well illustrated by the results of the *t-test* administered after the experiment (see Table 10).

*Table 10*

**The t-test figures for M and SD before and after the experiment in the EG and CG**

| Groups | Before the experiment | | After the experiment | |
|---|---|---|---|---|
| | $M$ | $SD$ | $M$ | $SD$ |
| EG, $n = 20$ | 3.4221 | 1.12243 | 3.2112 | 1.1117 |
| CG, $n = 20$ | 3.3251 | 1.11382 | 3.4111 | 1.2291 |

***Note:*** $M$ - arithmetic mean; $SD$ – standard deviations.

As we see, the figures for the EG decreased, while for the CG they went up.

The two-way ANOVA was administered to identify whether the dynamics in the variables depend on the approach used in this study (see Table 11).

*Table 11*

**Results of the two-way ANOVA analysis**

| *Variance Source* | *SS* | *df* | *MS* | *F-value* | *p* | $\eta^2$ | *n* |
|---|---|---|---|---|---|---|---|
| *Between groups* | *19201.14* | *23* | | | | | |
| *Group (Experimental/control)* | *31.11* | *1* | *31.22* | *.079* | *.789* | *0.001* | *40* |
| *Error* | *19839.47* | *23* | *422.49* | | | | |
| *Inside groups* | *10551.35* | *42* | | | | | |
| *Estimated parameters /Before-/After-the experiment)* | *1.18* | *1* | *10.14* | *.056* | *.778* | *0.001* | *40* |
| *Group*Parameter* | *177.31* | *1* | *168.32* | *.878* | ***.331*** | *0.012* | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Error* | *103879.01* | *33* | *143.322* | | | | |
| *Total* | *19693.03* | *17* | | | | | |

***Note:*** *ANOVA* – analysis of variance; *SS* – total mean square error; *df* – degrees of freedom*; MS* – mean square; *F*-value*;* $\eta^2$ – mutual coupling factor; $p$*>.05;* n – *the* number of students.

The result of the two-way ANOVA analysis allowed us to establish a statistically significant difference in the group parameters (.331) which proves that the dynamics in variables depend on the teaching approach used in this experiment.

The consolidated results of measurements of academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, performance in the ESP tests at the pre-experimental and post-experimental stages can be seen in Figures 2, 3 below.

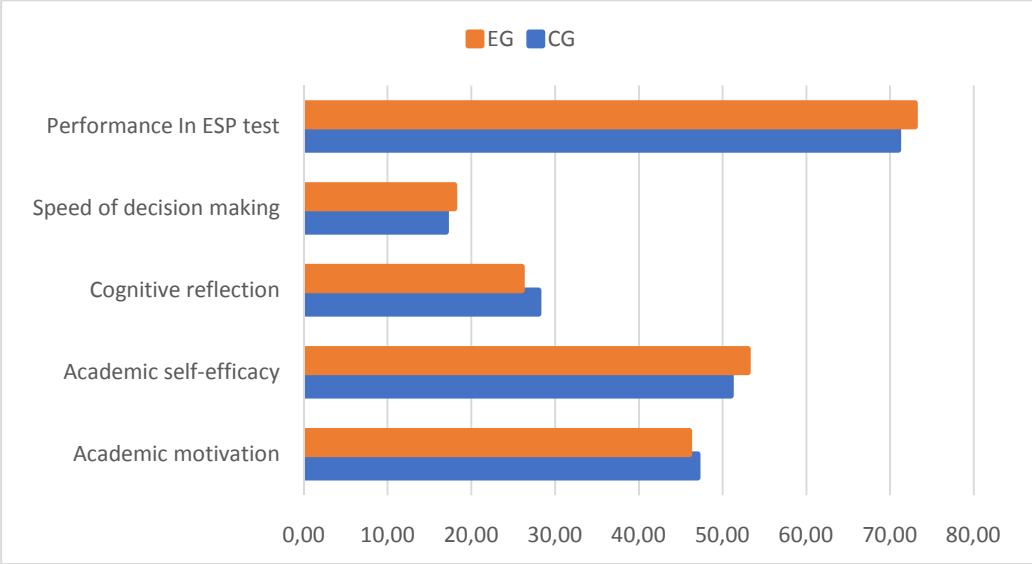


*Figure 2. The consolidated results of pre-experimental measurements of academic motivation, academic self-efficacy, cognitive reflection, speed of decision making and performance in the ESP tests, in %*

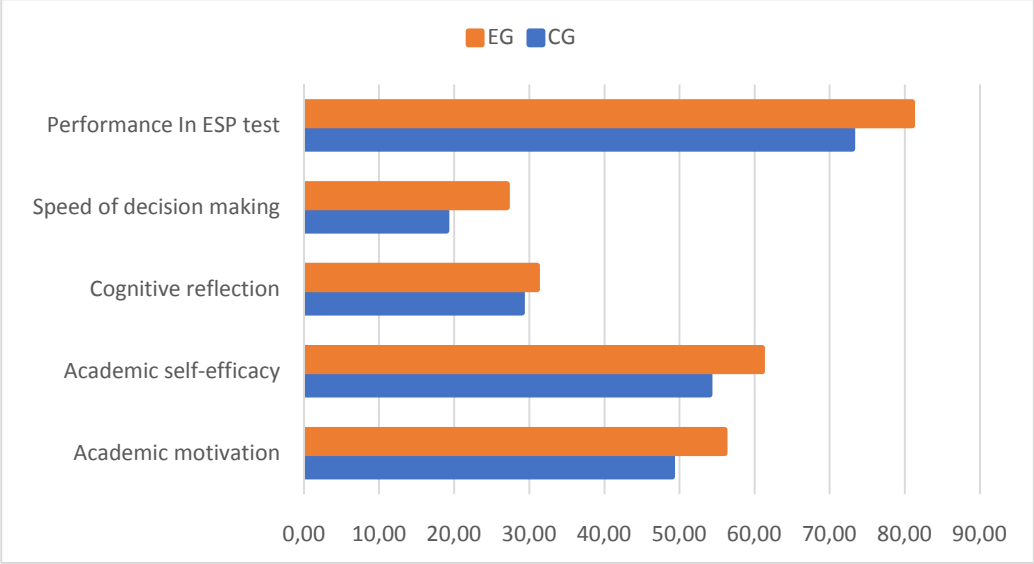


*Figure 3. The consolidated results of post-experimental measurements of academic motivation, academic self-efficacy, cognitive reflection, speed of decision making and performance in the ESP tests, in %*

The results above suggest that the use of clickers has a positive impact on both the language-related and personality-related aspects leading to the improvement of approximately 12 to 14% in every variable.

The above was validated by a semi-structured interview of the focus-group students ($n = 7$ people).

*Question 1. What were your impressions of participation in the ESP course using Kahoot, Socrative? Suggest your reasoning for positive or negative feelings.* 6 people responded it was fun, engaging, useful, and time-effective to learn the vocabulary, practice communication, and task solving skills. 1 person was negative about this study approach justifying their failures by the lack of necessary digital skills.

*Question 2. Was the course useful for your career as a specialist in Public Administration (in civil protection)? Suggest your reasoning.* 7 students reported it was useful for their job in terms of teamwork, meeting deadlines, working under "learning pressure".

*Question 3. Would you recommend such a course to your peers? Why?* 5 interviewees would certainly recommend this format of the ESP course as it creates a positive atmosphere and develops the skills which are needed for both their job and their studies. 2 people were hesitant about this.

*Question 4. What, do you think, could make this programme more useful for the students? Suggest your reasoning.* 7 students suggested prolonging the course with the use of the clickers.

This study found that the ESP learning environment supported by the use of clickers positively influences students' academic motivation, academic self-efficacy, cognitive reflection, speed of decision making, dominant brain type functioning, performance in listening, reading, speaking, and writing skills trained in the ESP course. This research proved that a game-based atmosphere in the lessons due to the use of clickers appeared to be a stimulating factor for the students to achieve more in the ESP classes. This study suggested that the use of the clicker systems in ESP teaching might bring additional benefits like customising, cost-effectiveness, reaching the students, availability.

This investigation goes in line with the existing studies in the field of using smart technology [29] and clickers in ESP and General language teaching [30]. Additionally, smart technology helped to turn a smartphone or iPad from a distractor into a useful pedagogic tool used for both classroom and out-the-classroom use.

## 5. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The findings for this study look logical concerning the current practices in ESP teaching. Integration of clicker systems as a type of smart technology into teaching English For Specific Purposes to Master's Degree students majoring in Public Administration (in civil protection) is effective as it triggers the students' desire to learn, creates a relaxed environment, develops students' cognitive sphere, and enhances their academic performance. Due to clickers, language learning turns into a challenging experience allowing students to consolidate their knowledge and master their skills in information search and processing. This teaching approach is student-centered, which reduces the teacher's dominance and gives way to the student's autonomy.

Further research is needed in the field of teacher training so that they could use the clickers as a pedagogic tool.

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# КЛІКЕРНІ СИСТЕМИ ЯК ЗАСІБ ІНТЕГРАЦІЇ СМАРТ-ТЕХНОЛОГІЙ У НАВЧАННЯ АНГЛІЙСЬКОЇ МОВИ МАГІСТРІВ ПУБЛІЧНОГО УПРАВЛІННЯ ТА АДМІНІСТРУВАННЯ

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**Анотація.** У статті наведено результати експериментальної перевірки впливу навчального середовища, що супроводжується з використанням клікерних систем під час вивчення дисципліни «Англійська мова за професійним спрямуванням» на навчальну мотивацію слухачів, їх академічну самоефективність та когнітивну рефлексію, на зміни в домінуючому типі мислення та швидкості прийняття слухачами рішень, на продуктивність у сприйнятті на слух, при читанні, говорінні та письмі. Дослідження ґрунтується на змішаних методах та зосереджено на таких клікерних системах, як-от: Kahoot та Socrative. Вхідні та вихідні дані отримано за допомогою моделі вимірювання академічної мотивації Раша Г. (Rasch G.), методики вимірювання рівня впевненості Бірна М. (Byrne M.) та Матотті Ш. (Matotti S.), методології Фредеріка С. (Frederick S.) для діагностики когнітивної рефлексії та прийняття рішень, тесту з «Англійської мови за професійним спрямуванням», що містив завдання з аудіювання, читання, говоріння та письма, і шкали оцінювання ставлення/мотивації Гарднера Р. (Gardner R.) для вимірювання змін домінуючого типу мислення. Параметри, що вимірюються, визначено як залежні змінні. На етапі пост-експерименту проведено напівструктуроване інтерв'ю з фокус-групою та якісний аналіз даних для підтвердження статистичної значущості результатів експерименту. Безкоштовне програмне забезпечення (калькулятор) ANOVA для некомерційного (академічного) застосування було залучено для

визначення залежності вище зазначених змінних від використання клікерів. Відповіді учасників фокус-групи було оброблено відповідно до існуючих рекомендацій до проведення такого типу досліджень. Встановлено, що інтеграція клікерних систем як виду смарт-технологій у викладання англійської мови для професійних цілей для магістрів зі спеціальності «Публічне управління та адміністрування (у сфері цивільного захисту)» є ефективною, оскільки викликає бажання в слухачів вчитися, створює невимушену атмосферу на заняттях, розвиває пізнавальну сферу та покращує результати навчання слухачів. Зазначено, що завдяки клікерам, вивчення мови перетворюється на корисний досвід, що дозволяє слухачам закріпити знання та оволодіти навичками пошуку й обробки інформації. Встановлено, що такий підхід до навчання, орієнтований на слухача, зменшує домінування викладача та сприяє формуванню навчальної автономії слухачів.

**Ключові слова:** смарт-технології; англійська мова за професійним спрямуванням; магістри за спеціальністю «Публічне управління та адміністрування»; клікерні системи.

# КЛИКЕРНЫЕ СИСТЕМЫ КАК СРЕДСТВО ИНТЕГРАЦИИ СМАРТ-ТЕХНОЛОГИЙ В ОБУЧЕНИЕ АНГЛИЙСКОМУ ЯЗЫКУ МАГИСТРОВ ПУБЛИЧНОГО УПРАВЛЕНИЯ И АДМИНИСТРИРОВАНИЯ

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**Аннотация.** В статье приведены результаты экспериментальной проверки влияния учебной среды, сопровождающейся с использованием кликерних систем при изучении дисциплины «Английский язык профессионального направления» на учебную мотивацию слушателей, их академическую самоэффективность и когнитивную рефлексию, на изменения в доминирующем типе мышления и скорости принятия слушателями решений, на производительность в восприятии на слух, при чтении, говорении и письме. Исследование основывается на смешанных методах и сосредоточено на таких кликерних системах, как Kahoot и Socrative. Входные и выходные данные получены с помощью модели измерения академической мотивации Раша Г. (Rasch G.), методики измерения уровня уверенности Бирна М. (Byrne M.) и Матотти Ш. (Matotti S.), методологии Фредерика С. (Frederick S.) для диагностики когнитивной рефлексии и принятия решений, теста по английскому языку профессионального направления, включавшему задачи по аудированию, чтению, говорению и письму, и шкалы оценивания отношения/мотивации Гарднера Р. (Gardner R.) для измерения изменений доминирующего типа мышления. Указанные параметры измерения определены как зависимые переменные. На этапе пост-эксперимента проведено полуструктурированное интервью с фокус-группой и качественный анализ данных для подтверждения статистической значимости результатов эксперимента. Кроме того, бесплатное программное обеспечение (калькулятор) ANOVA для некоммерческого (академического) использования было применено для определения зависимости вышеупомянутых переменных от кликерных систем. Ответы участников фокус-группы обработаны в соответствии с рекомендациями к проведению таких исследований. Установлено, что интеграция кликерних систем как вида смарт-технологий в преподавание английского языка для профессиональных целей для магистров по специальности «Публичное управление и администрирование» (в сфере гражданской защиты) является эффективной, поскольку вызывает желание у слушателей учиться, создает непринужденную атмосферу на занятиях, развивает познавательную сферу и улучшает результаты обучения слушателей. Отмечено, что благодаря кликерным системам изучение языка превращается в полезный опыт, позволяющий слушателям закрепить знания и овладеть навыками поиска и обработки информации. Установлено, что такой подход к обучению, ориентированный на слушателя, уменьшает доминирование преподавателя и способствует формированию учебной автономии слушателей.

**Ключевые слова:** смарт-технологии; английский язык профессионального направления; магистры по специальности «Публичное управление и администрирование»; кликерные системы.

## APPENDIX 1. LESSON PLAN EXAMPLE

*Lesson Topic:* Business Management and Public Administration
*Type of the class:* Quest-based and discussion-driven class
*Teacher's role:* moderator/facilitator
*Objectives:*

- to improve students' argumentative, counter-argumentative and reasoning skills;
- to practice students' presentation skills;

*Expected outcomes:*

- students' ability to express and justify their opinion using appropriate functional language;
- students' awareness of differences between business management and public administration, theory and trends in both.

LESSON PLAN

| Segment/Activity | Presentation or tactics of engagement of students | Time |
|---|---|---|
| Lead-in | *Group discussion:* A teacher starts it by moderating the discussion of a question: *What is the difference between business management and public administration? Explain your reasoning. Is management related to a legal or social domain?* | *5 min* |
| Eliciting | The Ss, mingled in pairs, are given handouts with headings written on them: "*Business management*", and "*Public administration*." The Ss are asked to work out together and write a definition of both. Having finished, they are supposed to pass their handout to the next pair who are to do the same. Concurrently, they receive the handout from the other pair and are expected to write the definition for the notion. | *10 min* |
| Commenting | When everybody has finished, each pair read the definitions they most agree with and comment on them. | *5 min* |
| Kahoot-based activity | **Kahoot-based quiz.** Borrowed and modified from https://quizizz.com/admin/quiz/5da2a06bc38d36001abfc2a1/introduction-to-public-administration; and https://www.brainscape.com/subjects/public-administration | *25 min* |
| Revising the signposting language | Ss do the quick quiz to revise the signposting language. | *5 min* |
| Discussion | *Questions:*<br>• What is Business Management? What is Public Administration?<br>• What makes them effective?<br>• How can you delegate responsibility in each case?<br>• Search the Web and find the answer to the question: What trends are dominating in business management and public administration? Suggest your idea why. | *25 min* |
| Wrap-up | The teacher summarises and provides comments on the students' ideas and performance. | *5 min* |
| Assignment | Provide a guided written feedback to one of your peer's answers in the discussion section. | |