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# STREAMING OF EFL STUDENTS: EVALUATION OF EFFECTIVENESS

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## *Abstract*

The purpose of this study is to determine the influence of streaming on the effectiveness of mastering a subject (on the example of the discipline "Foreign Language"). The 2nd year students taking their 3rd semester at SPbPU in the 2019-2020 academic year are of particular interest of the study as they have experienced both types of educational process organisation naturally and can compare them directly. This study adopts an inductive approach; a quantitative method of collecting data is applied. Most students of basic and advanced levels noted an increase in the levels of their psychological comfort and effectiveness of studying the discipline. Also, the extra tasks were assessed. The highest scores were given to the criteria "broadening of outlook" (26.1% and 34.8% in basic and advanced groups, respectively), and "stimulating analytical/critical thinking" (17.4% and 26.1% in basic and advanced subgroups respectively). Statistical independence between the answers of the respondents from basic and advanced groups was confirmed by the Fisher's exact test ($\alpha = 0.05$). The results obtained can be used to justify the need to create a favourable learning environment and develop complementary curriculum tasks due to their impact on the effectiveness of training of future specialists.

## 1.  Introduction

Proficiency in a foreign language is one of important components of a modern specialist professional culture. Mastering a foreign language at the level necessary for a successful career is one of the most difficult tasks that a future specialist faces while studying at university (Almazova et al., 2016; Odinokaya et al., 2019; Stroganova et al., 2019; Voronova et al., 2020) In the environment of a non-linguistic university a lot of additional difficulties arise; and attempts to overcome them are often superficial.

In the context of increasing the effectiveness of teaching a foreign language and other subjects, a high level of interest is shown in teaching methods and techniques which are characterised as innovative. The introduction of new educational technologies undoubtedly contributes to the attractiveness and competitiveness of a university, but it does not always have a positive effect in terms of raising consumer attitude to education among students (Pokrovskaia et al., 2019). However, the effectiveness of teaching methods and techniques depends on factors enveloping the process of education which are often overlooked (Shephard & Egan, 2018; Truta et al., 2018).

## 2.  Problem Statement

Psychological difficulties arising in students of non-linguistic universities have complex consequences. They are global in their nature, without being bound to a particular academic discipline. (Eegdeman et al., 2018) Researchers all over the world are involved in studying the influence of educational process environment on students' motivation and the quality of their learning (Cocca & Cocca, 2019; Rotgans & Schmidt, 2014; Savage et al., 2011). According to the study conducted at the Herzen State Pedagogical University of Russia (St. Petersburg), positive class environment is one of the most important factors indicated by students while assessing the quality and attractiveness of university education (Strielkowski et al., 2018).

The focus of the present study is on the following aspects that envelope the learning process at the university:

- psychological comfort of students while classroom activities;
- the use of extra tasks that stimulate creative/critical/analytical thinking.

## 3.  Research Questions

Thus, the research questions are:

1. To evaluate the effect of the streaming in terms of creating more favourable learning conditions.

2. To evaluate the content of the extra tasks proposed at the initial stage for their further development.

3. To determine the further direction of development and improvement of the applied method.

## 4. Purpose of the Study

The purpose of this study is to determine the influence of the factors that envelope learning processes on the effectiveness of mastering a subject (on the example of the discipline "Foreign language").

## 5. Research Methods

This study adopts an inductive approach to determine whether the streaming improves the quality and effectiveness of classroom activities. The experiment is planned to be carried out in two stages: the first stage – the 2019-2020 academic year (bringing intermediate results), the second stage – the 2020-2021 academic year. The total results of these two stages will be summarised to evaluate the proposed methodology. At the first stage, a quantitative method of collecting data is applied. The questionnaire (see Appendix) contains closed questions with an answer to choose from the proposed options; however, respondents are offered the opportunity to comment on their choice briefly. Also the questionnaire contains rating question to evaluate the content of the extra tasks. The use of these research tools contributes to the efficiency of respondents' time taken and facilitates the processing of data obtained.

### 5.1. Participants

The study has been being conducted at the Peter the Great St. Petersburg Polytechnic University (SPbPU) since the beginning of 2019-2020 academic year. The experiment participants are 1st and 2nd year students of the Institute of Computer Science and Technology (about[1] 700 and 600 students, respectively) and the faculty of the Department of Foreign Languages of the Institute of Humanities (about[2] 25 lecturers). The 2nd year students taking their 3rd semester in the 2019-2020 academic year are of particular interest of the study as they have experienced both types of educational process organisation naturally and can compare them directly. This feature is the focus of the intermediate assessment of the experiment procedure.

### 5.2. Research Design

To form advanced level groups, the students were tested at the beginning of the semester. The first year students were offered a level B1 (threshold level) test, since this level is required to be achieved by the end of the general secondary education program according to the Federal state educational standard of the Russian Federation. The second year students were offered the test based on the material they had studied during their 1st and 2nd semesters at SPbPU. The test results were ranked, and the students with the best results formed advanced level groups. At the end of the 1st/3rd semester, the survey was conducted among the 2nd year students. The purpose of the survey was to assess the effectiveness of learning a foreign language in separated groups compared to mixed ones. As mentioned above, the 2nd year students got a unique opportunity to experience different educational process organisations naturally.

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[1] The number of students may vary slightly during each semester. The reason for this is the transfer, readmission, expulsion of students.

[2] A teacher receives a group for a semester, so the faculty working with groups under the study may vary slightly.

### 5.3. Data Collection

During the semester, the students of advanced groups mastered the same program as the students of basic groups but supplemented with special tasks. The students of basic groups were also allowed to complete these tasks voluntary. Among the students of basic groups, 38% of respondents indicated completing extra tasks in the questionnaires.

The survey among the 2nd year students was conducted at the end of the autumn semester (December 2019). The research data were obtained by the means of Google Forms. This tool allowed organizing the survey in a convenient remote way and getting instant access to its results. Participation in the survey was anonymous and voluntary. As a result, 48 questionnaires were received and processed. The processing of the questionnaire data was carried out using MO Exel and SPSS (IBM Corp., version 23). A statistically significant difference was estimated by the Fisher's exact test with the admissible error limit $\alpha = 0.05$. Thereafter, as a result of a comparative analysis of the results, the intermediate results of the experiment were summarized. The results of the first stage contribute to the solution of research tasks 1 and 2.

## 6. Findings

At the stage of the intermediate assessment the level of psychological comfort under the conditions of streaming was revealed. In addition, the content of the extra tasks was assessed.

### 6.1. Student Survey Results

Students from both basic and advanced groups participated in the survey. They were asked to assess the changes of the organisation of the educational process according to the following criteria:

- the level of psychological comfort when learning in groups before and after streaming (Table 01);
- the way streaming affects the effectiveness of mastering the subject (Table 02);
- the way the extra tasks affect the effectiveness of mastering the subject (Table 03).

In addition to closed questions with an answer to choose from the proposed options, the questionnaire contained special boxes providing an opportunity for remarks, thus, the respondents could comment on their choice briefly.

**Table 01.** Assessment of the level of psychological comfort.

| Comparison of the levels of psychological comfort before and after streaming | Students of basic groups | Students of advanced groups |
|---|---|---|
| More comfortable in a peer group | 25.0% | 25.0% |
| More comfortable in a mixed group (before streaming) | 2.1% | 8.3% |
| Equally comfortable | 14.6% | 20.8% |
| Equally uncomfortable | 2.1% | 2.1% |

The result of the Fisher's exact test showed that the majority (25%) of students of both groups statistically independently ($p = 0.711$; $\alpha = 0.05$) confirmed an increase in the level of psychological

comfort after streaming. From the comments given by the respondents regarding this aspect, the influence of being in the environment of a homogeneous contingent can be especially highlighted. The exact comments on this issue are given below:

- "a more comfortable pace of work";
- "increased activity, since there are no students in the groups that are significantly more skilful;
- "increased interest, more interesting discussions";
- "reducing the number of people in groups, which resulted in more conversational practice".

The respondents who noted the same level of comfort indicated that they were used to different levels of language proficiency since their school years.

**Table 02.** Assessment of the effectiveness of mastering the subject

| Comparison of the effectiveness of mastering the subject before and after streaming | Students of basic groups | Students of advanced groups |
|---|---|---|
| The effectiveness rises | 25.0% | 39.6% |
| The effectiveness declines | 4.2% | 4.2% |
| No changes | 14.6% | 12.5% |

The result of the Fisher's exact test showed that most students of both basic (25%) and advanced (39.6%) groups statistically independently ($p = 0.662$; $\alpha = 0.05$) confirmed the increase in the efficiency of mastering the subject after streaming. From the comments given by the respondents regarding this aspect, the influence of being in the environment of a homogeneous contingent can be especially highlighted either. The exact comments on this issue are given below:

- in a strong group, more attention is paid to things that students did not know about or just heard about, it opens us a lot of interesting things";
- "after streaming, it has become easier to perform tasks related to interaction with other students, the material is more effectively communicated to each student";
- "an opportunity to work with materials of a higher level, which made it possible to learn something new";
- "do not have to study the same information several times, as the basic groups do, no time waste analysing the base material";
- "a desire to increase the level arises";
- "as it became more interesting, there was a motivation to perform tasks";
- "English proficiency rises faster, due to the knowledge from new groupmates".

**Table 03.** Assessment of the impact of the extra tasks on the effectiveness of mastering the subject

| Comparison of the effectiveness of mastering the subject before and implementing the extra tasks | Students of basic groups | Students of advanced groups |
|---|---|---|
| The effectiveness rises | 23.5% | 29.4% |
| The effectiveness declines | 0% | 0% |
| No changes | 23.5% | 23.5% |

The result of the Fisher's exact test showed that the students of both basic (23.5%) and advanced (29.4%) groups statistically independently (p = 0.508; α = 0.05) positively assessed the effect of implementing the extra tasks. None of the respondents noted deterioration.

### 6.2. Assessment of the extra tasks

The content of the extra tasks was assessed on a five-grade scale (where 5 is the maximum, 1 is the minimum) according to the following criteria:

- relevance;
- matching the interests of students of specialties related to the IT field;
- stimulation of analytical/critical thinking;
- stimulation of creative thinking;
- broadening of outlook.

The results of the assessment are shown in table 4.

**Table 04.** Assessment of the content of the extra tasks

| Criterion | Grade | Students of basic groups | Students of advanced groups | Fisher's coefficient, α = 0.05 |
|---|---|---|---|---|
| Relevance | 1 (min.) | 0% | 0% | 0.172 |
| | 2 | 0% | 0% | |
| | 3 | 4.3% | 26.1% | |
| | 4 | 17.4% | 8.7% | |
| | 5 (max.) | 13.0% | 30.4% | |
| Matching the interests of students of specialties related to the IT field | 1 (min.) | 0% | 0% | 0.158 |
| | 2 | 4.3% | 13.0% | |
| | 3 | 4.3% | 21.7% | |
| | 4 | 17.4% | 4.3% | |
| | 5 (max.) | 8.7% | 30.4% | |
| Stimulation of analytical/critical thinking | 1 (min.) | 0% | 4.3% | 1.0 |
| | 2 | 0% | 4.3% | |
| | 3 | 4.3% | 8.7% | |
| | 4 | 13.0% | 17.4% | |
| | 5 (max.) | 17.4% | 26.1% | |
| Stimulation of creative thinking | 1 (min.) | 0% | 4.3% | 0.946 |
| | 2 | 4.3% | 4.3% | |
| | 3 | 4.3% | 17.4% | |
| | 4 | 8.7% | 8.7%0.622 | |
| | 5 (max.) | 17.4% | 30.4% | |
| Broadening of outlook | 1 (min.) | 0% | 0% | 0.622 |
| | 2 | 0% | 4.3% | |
| | 3 | 4.3% | 21.7% | |
| | 4 | 4.3% | 4.3% | |
| | 5 (max.) | 26.1% | 34.8% | |

The results of the Fisher's exact test showed that students of both basic and advanced groups statistically independently rated the content of the extra tasks highly. However, a larger number of

medium and low grades should be noted in advanced groups, where the respondents are more skilful in mastering foreign language.

The results obtained at the current stage of the study confirm the thesis about the relations between the effectiveness of training and the factors enveloping the educational process. (Cocca & Cocca, 2019) As shown in the previous section, after separating the students according to their level of foreign language proficiency, the respondents from different groups independently noted a positive trend.

The positive influence of being in the environment of a peer or slightly superior in terms of foreign language proficiency contingent is especially noted. The presence of students with a high pre-university level of foreign language proficiency in the academic groups negatively affected the motivation of students with a lower level. According to the comments of the respondents, they "saw no sense in developing their own skills, since more skillful students draw teachers' attention to themselves when completing assignments by giving answers faster and contributing to discussions".

Also, taking into account that the extra tasks for the students of basic groups are optional, the fact of their completing confirms the development of students' self-regulation ability, which also has a positive effect on learning a foreign language (Garanina & Maltseva, 2016; Odinokaya et al., 2019). In addition, the completing of complicated extra tasks by the students of basic groups is an indicator of the "dominance of motivation to succeed" (Antoshkova & Borschenko, 2018, p. 94) Thus, in the future it is possible to suppose the transfer of the developed mechanisms to other disciplines and the improvement of studying skills in general (Jackson, 2007; Kunat et al., 2019).

Research perspectives:

1) The second monitoring point of the study is the autumn semester of the 2020-2021 academic year, when first-year students who has begun the training under the streaming conditions will complete the studying of the discipline "Foreign Language: Basic Course", according to their curriculum.

2) The third monitoring point is the spring semester of the 2020-2021 academic year, when the students participating in the experiment will complete the studying of the discipline "Foreign Language: Professionally Oriented Course", according to their curriculum.

3) The extra tasks will also be assessed in order to improve the quality of their content and adjusted at each stage of the experiment in terms of relevance and development of students' outlook and thinking.

## 7. Conclusion

The purpose of this study is to reveal the influence of factors enveloping the educational process (for example, students' psychological comfort during classes) on the effectiveness of training. The study is conducted on the example of the discipline "Foreign Language" with 1-2 year students of a technical university. To achieve the goal 1) classroom activities of the discipline "Foreign Language" are scheduled in streams; 2) advanced level groups are formed in each stream; 3) the extra tasks have been prepared for the students of advanced groups (the students of basic groups are allowed to perform them voluntary).

At the intermediate stage of experiment monitoring, the survey among the 2nd year students (3rd semester), who began their training before streaming, was conducted and the following results were obtained:

1) Most students of basic (25%) and advanced (25%) levels noted an increase in the level of psychological comfort during classroom activities after streaming, largely due to the homogeneous environment. The respondents also noted an increase in their own activity during classes and conversational practice.

2) Most students of basic (25%) and advanced (39.6%) levels noted an increase in the effectiveness of studying the discipline "Foreign Language" after streaming. However, 4.2% of respondents (both basic and advanced) noted a decrease in their efficiency. According to the comments given by the respondents, the main aspects that influenced the increase in efficiency are: the extra tasks that stimulate various types of thinking, as well as the exchange of knowledge with new groupmates.

3) The extra tasks were assessed by the respondents according to the following criteria: relevance, matching the interests of students of your specialty, stimulating of analytical/critical thinking, stimulating of creative thinking, broadening of outlook. The highest scores were given to the criteria "broadening of outlook" (26.1% and 34.8% in basic and advanced groups, respectively), and "stimulating analytical/critical thinking" (17.4% and 26.1% in basic and advanced subgroups respectively).

Statistical independence between the answers of respondents from basic and advanced groups was confirmed by the Fisher's exact test ($\alpha = 0.05$).

The next monitoring points of the experiment are planned in the 2020-2021 academic year.

The results obtained after the intermediate and full assessments of the results of the experiment can be used to justify the need to create a favourable learning environment and develop complementary curriculum tasks due to their impact on the effectiveness of training of future specialists.

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## **Appendix.** The questionnaire for 2nd year students

1.  Indicate the level of your group:

☐ Basic

☐ Advanced

2.  If you are a student of a basic level group, have you completed any extra tasks for advanced level groups? (If you are a student of an advanced level group, skip this question)

☐Yes. I like challenging tasks.

☐Yes. I needed extra grades.

☐Yes. (Own option) _____

☐No. I did not dare to take extra tasks (I was not sure that I could solve it, etc.)

☐No. I did not want to make an effort.

☐No. (Own option) _____

3.  Compare the level of your psychological comfort when training in classrooms before and after streaming:

☐More comfortable in a peer group.

☐More comfortable in a mixed group (before streaming).

☐Equally comfortable.

☐Equally uncomfortable.

Briefly comment on your answer _____

4.  Did the streaming affect the effectiveness of your subject mastery?

☐Yes. It got better.

☐Yes. It got worse.

☐No.

Briefly comment on your answer _____

5.  If you performed the extra tasks, did this affect the effectiveness of your subject mastery?

☐Yes. It got better.

☐Yes. It got worse.

☐No.

Briefly comment on your answer _____

6.  If you performed the extra tasks, please rate their content on a scale of 1 to 5 (1 is the minimum, 5 is the maximum). Criteria:

| Criterion | Grades | | | | |
|---|---|---|---|---|---|
| Relevance | 1 | 2 | 3 | 4 | 5 |
| Matching The Interests Of Students Of Specialties Related To The IT Field | 1 | 2 | 3 | 4 | 5 |
| Stimulation Of Analytical/Critical Thinking | 1 | 2 | 3 | 4 | 5 |
| Stimulation Of Creative Thinking | 1 | 2 | 3 | 4 | 5 |
| Broadening Of Outlook | 1 | 2 | 3 | 4 | 5 |