

# Elements of Gamification in the Practice of Language Training for the Students of Technical and Managerial Areas

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**Abstract**—The relevance of this study is due to the need for searching perspective ways to organize interactive learning for modern students of generation Y and Z, who are highly involved in computer games. As an interactive teaching method it is proposed to introduce gamification elements into the educational process.

The aim of the study is to obtain experimental results of the gamification elements influence in the process of language training of students of technical and managerial areas on their academic progress.

The main research method is a pedagogical experiment (stating, formative and control stages). Theoretical research methods were also used, including analysis, comparison and synthesis of scientific results. Empirical methods were used - summarizing and grouping of research results, information processing software. Interview and observation methods were used to collect primary information.

For the first time, the progress in students' studies and their attendance during language training with elements of gamification was experimentally recorded. This was due to increased motivation, engagement and cohesion of students with a more marked result for the technical students.

The authors' experience in developing the methodology of the game and the results of its implementation will be useful for further gamification of language training.

**Keywords**—*gamification; motivation; involvement; academic progress; pedagogical experiment.*

## I. INTRODUCTION

Modern educational standards of preparation for undergraduate programs provide for the allocation of interactive training hours in addition to traditional types of lectures and seminars. In a series of this study authors works identified that the use of interactive teaching methods, in particular business games, in the course of conducting classes in a foreign language allows to improve the level of practice-oriented foreign terminology, to develop communication skills, foster creative thinking of students, and so on [1-3].

The problem of widespread introduction of interactive methods in the educational process is some resistance to their use by teachers. Indeed, an additional burden is placed on the teacher to develop the content, procedure and system of learning outcomes evaluation with the use of interactive cases, projects, business games, etc. The situation is complicated by low motivation of students to study general subjects in general and English in particular.

The relevance of this study is due to the need to find promising ways to organize interactive learning for modern students of generations Y and Z [4], characterized, among other things, by high involvement in interaction with the virtual environment and immersion in computer games [5]. The introduction of gamification elements into the educational process is proposed as a method of interactive learning.

## II. LITERATURE REVIEW

The introduction of the term "gamification" is associated with the name of N. Pelling (2002) [6], and the wide spread of this phenomenon in the business sphere and its gradual introduction into other spheres of activity, with the names of G. Zickermann (2010) and K. Werbach (2012). So, Mr. Straman initiated the international agrification forum, Werbach K. introduced a course on gamification into educational process [7], which sparked interest from both scientific community and business representatives to use the method.

Based on the content analysis of the gamification definition produced by Dynkina E. D. according to the results of scientific publications of various authors, it can be noted that this method involves the use of gaming technologies in non-gaming spheres; the introduction of pleasure elements in activities that do not deliver it; the development of gaming thinking on the basis of computer-gaming techniques [8]. In

general, it is advisable to use gamification to increase the motivation of students, their involvement in solving non-game tasks and effective joint activities [9].

The decision of the teacher on the introduction of gamification methods in the educational process requires the prediction of educational behavior and communication interactions, taking into account the future professional activity of students. At the same time, it is necessary to take into account the need to improve the skills of teachers in terms of the communicative competence development [10], because when introducing elements of gamification in the educational process, the teacher acts as a moderator of the gameplay.

In addition, the introduction of gamification elements in the process of training students requires increasing functional literacy in terms of the digital technologies use [11]. Indeed, fluency in the skills of the teacher organizational skills and susceptibility of the educational process gamification to rapidly changing digital solutions, increases the motivation of teachers to introduce new types of interactive interaction and has a positive impact on the motivation of students [12].

The depth of digital technologies penetration into the gamification process can be total, for example, when using fully virtual professionally-oriented games by large companies to improve the skills of personnel. In the field of education, it is considered more traditional to conduct the game under the control of a teacher using electronic resources [13].

The introduction of gamification elements should involve the achievement of specific goals, the formulation of which is based on the presence of any problems. Problems can be low involvement and lack of trainees motivation, lack of group cohesion, etc. the Achievement of this goal is possible only with careful development of the game plan-the establishment of the roles of each player and maintaining their emotional and cognitive activity. Important in gamification is the development of progress scales, ratings, reward systems and levels, similar to computer games [14].

The problem of teaching a foreign language in the framework training non-linguistic areas basic disciplines is the lack of understanding by students of the need for a foreign language in professional activities, which reduces their motivation to learn and involvement in work. On the other hand, generations Y and Z are open to interactive interactions and the digital environment, which allows us to recommend the introduction of gamification elements in the educational process.

Thus, for the introduction of gamification elements in the practice of students of technical and managerial specialties language training, it is necessary to develop a methodology for the game, the effectiveness of which can be evaluated during the pedagogical experiment.

### III. RESEARCH METHODOLOGY

The aim of the study is to obtain experimental results of the gamification elements influence in the process of language training of students of technical and managerial areas on their academic performance.

The leading method of this problem research is pedagogical experiment (ascertaining, forming and control stages). Theoretical research methods were also applied, including analysis, comparison, synthesis, classification and generalization of scientific results. Empirical methods were used, such as literary and retrospective analysis, methods of summarizing and grouping research results, methods of software information processing. To collect primary information, we analyzed the statements and journals of teachers of the selected areas training for 5 years, used a survey and observation.

The place of the experiment was Kazan national Research Technological University (KNITU), Department of "Foreign languages in professional communication", natural learning conditions. Two parallel identical experiments were carried out in groups of students of the directions of training "Applied mathematics and Informatics" and "Management". In each direction of training, two groups (one control and one experimental) with similar performance indicators in the discipline "Foreign (English) language" were selected.

The period of the experiment covered the 4th semester of learning English (2nd semester of the 2nd year of study). During this period, according to the curriculum and work program, language training acquires a professional orientation. The calendar period of the experiment – spring semester, 2019. The average number of students in groups 22 people.

The final criterion for evaluating the results of the experiment was academic performance, but the components affecting it, such as motivation, involvement, cohesion and attendance, were also evaluated.

At the ascertaining stage of the experiment (February-March), academic performance was assessed according to the results of traditional intermediate certification (testing, translation, retelling, answers to questions, discussion on texts). Participants – all groups. The formative stage involved the game "Prospects and limitations of the digital environment in education". Participants – on one group from each direction of preparation, the second groups in each direction-control. At the control stage, the final testing of both experimental and control groups was carried out.

## IV. RESULTS

### A. *Ascertaining step.*

According to the analysis of statements, and magazines of academic achievement in groups of students training areas "Applied mathematics and Informatics" (for 2 groups) and "Management" (for 2 groups) 4 semester 2014-2017, and the results of interim certification during the first half of the spring semester 2019 the following average distribution of the ratings (on key statements) was established:

- "Applied mathematics and Informatics": excellent-28%, good-52%, satisfactory-17%, failed - 3%.
- "Management": excellent-37%, good-51%, satisfactory-11%, failed - 1%.

It should be noted that the annual distribution has similar values, the final score in the statement mainly coincides with the result of the intermediate certification (in the middle of the semester) and differs within the margin of error.

There is a steady trend of obtaining a greater number of higher scores and better attendance of students in the direction of "Management", in connection with the choice of this study direction by persons initially focused on the relationship "man-man". This provides the ability to build communication and dialogue communication, both with the teacher and within the group, mutual assistance and cohesion.

According to the results of the survey on the need and prospects of using a foreign language in professional communication, it was found that the direction "Management" attaches great importance to language training for future management activities. On the other hand, according to the results of monitoring the progress of students' answers in the direction of "Management" in the classroom, it can be noted that along with the activity and readiness for answers, there is negligence in the use of lexical and grammatical constructions. There is a high fluency of speech, to the detriment of literacy.

Students of the training direction "Applied mathematics and computer science" are associated with the relationship of "man-technique" or "man-sign system" and initially less motivated to build interpersonal communication links. It should also be noted that General humanitarian disciplines, in particular English, are often perceived by students of the training direction "Applied mathematics and computer science" as unnecessary in the professional sphere.

Indeed, in the field of computer science, many terms and designations are used in the English version. This reduces the motivation to learn the language, leads to an increase in the number of absences in student groups, as well as to a decrease in involvement in the process of practical work at seminars and late delivery of tasks and control points.

On the other hand, it can be noted that the level of lexical and grammatical tests performance in the direction of "Applied mathematics and Informatics" is much higher than in the direction of "Management", which is probably due to the ability to logically correctly structure information, including memorizing the principle of constructing language structures. However, there are problems of reading speed, self-presentation of information and participation in discussions.

The hypothesis for the formative stage was the following provision: "Academic performance and attendance of students in the course of language training with elements of gamification will increase, due to increased motivation, involvement and cohesion of students, with a more pronounced result for the direction of" Applied mathematics and computer science».

### *B. Formative stage*

The teacher was the organizer of the game "Prospects and limitations of the digital environment in education". The purpose of introducing gamification elements for students is to increase motivation to learn the language, increase involvement in the learning process, form group cohesion,

which will contribute to achieving the ultimate goal of the experiment.

The game was held in the second half of the 4th semester, after processing the results of the ascertaining experiment. Experimental groups, one from each direction of training, were divided into subgroups of 4-5 people, only 4 subgroups. The second groups in each direction of training were control. The subgroups received a task for independent work, the discussion and progress of which was supervised by the teacher within the hours of interactive training. Each subgroup received a sub-topic for the study:

- "Prospects and limitations of electronic document circulation".
- "Prospects and limitations of electronic libraries: EBC "Knigafond", EBC "LAN", EBC "University library", etc.
- "The prospects and limitations of electronic systems for verification of originality".
- "Prospects and limitations of scientific publications electronic databases: e-library, Web of Knowledge ScienceDirect, etc.

The choice of topics is predetermined not only by the trend of global digitalization of education, but also by the practical value of digital resources specified in the sub-themes for further education and research activities of students. The subgroup will have sub-themes randomly, by drawing cards with their names. Roles in groups were distributed as follows: "journalist" - 1 person, "spy" - 1 person, "assistant journalist" - 1 person, "assistant spy" - 1 person (if subgroups of 4 people), "mediator" 1 person (if subgroups of 5 people). Collection of information by members of the subgroup is carried out within a month.

Thus, the "Journalist" collects data from open sources about the general concept of the digital system specified in the sub-topic, the result is a report for 5 minutes with a presentation. Work "journalist" and "assistant journalist" build together, because the task of "assistant journalist" to make a report on the prospects (advantages), ease of use, etc. advantages of systems.

"Spy" gets a job to find in KAZAN a Department responsible for work with these systems, figure out the order of works in digital systems, depending on sub-topics. Work "spy" and "assistant spy" build together, because the task of "assistant spy" to make a report on the shortcomings, problems, limitations of systems. "Mediator" (if available) summarizes all the "pros" and "cons" stated by previous speakers, "reconciling the parties".

To avoid duplication of information the speakers have to cooperate and plan together as a team. Reports (for 5 minutes), presentations and work in the audience is conducted in English. In addition, the active participation of the subgroup and other subgroups members in supporting opposing opinions (in the discussion) and fixing errors of lexical and grammatical constructions of speakers (when detected) and their discussion

after the reports is evaluated. Subgroups are allocated by week to report in the last month of the semester.

Important for the dynamic conduct of the game is a system of levels, ratings and other scales of evaluation, allowing to assess the progress of both the individual and the group. The developed evaluation system for this experiment is multilevel and will be described in separate publications.

The general principle of a specially developed digital tool for evaluating results involves obtaining certain types of "smiles" for the level of linguistics, completeness, logic, clarity of the material presentation, support for another participant in case of difficulty with the answer, participation in dialogue, etc.

A certain number and type of "smile" will lead to the level of "specialist" / "master" / "expert", which gives additional "life" (in this case - the right to make a mistake), which can be shared with another participant. Progressive assessment scale, level system close to computer games, visualization of the progress of an individual and a subgroup is perceived by students much more positively, relative to point-rating methods.

### *C. Control stage*

Mandatory for the control stage is the organization of the final generalizing classes on traditional methods (grammar, vocabulary, reading, retelling, questions, discussion) in both experimental and control subgroups, before the final exam.

Parameters reflecting their indicators, results of control registration of behavior and progress can be presented as follows (experimental / control groups):

- motivation for the criterion desire to give the answer first (a quick job and the show of hands): "Applied mathematics and Informatics" - 8 people/3 person (growth in 2,6 times) and "Management" - 7 people/4 people (an increase of 1.75 times).
- involvement, according to the criterion of desire to participate in the discussion, ask questions: "Applied mathematics and Informatics" - 14 people/6 people (2.3 times increase) and "Management" - 16 people/10 people (1.6 times increase).
- cohesion, according to the criterion of the desire to give explanations and help with the answer in case of difficulties for another member of the group: "Applied mathematics and computer science" - 6 people/2 people (an increase of 3 times) and "Management" - 10 people/6 people (an increase of 1.7 times).

Attendance was assessed for the entire period of the experiment and averaged 96% for experimental groups and 80% for control groups. Distribution of marks by results of final examination on the average on two experimental and two control groups (testing, traditional work with the text, answers to questions of the teacher):

- "Applied mathematics and Informatics" (experiment / control): excellent-34% / 29% (increase by 5%), good-

55%/51%, satisfactory-11/19% (decrease by 8%), failed - 0/1%.

- "Management": excellent-49% / 36%, good-55/52%, satisfactory-6/10%, failed-1/2 %.

The distribution of estimates in the control groups is close to that obtained at the ascertaining stage of the experiment. There is a significant increase in motivation, involvement, cohesion and, as a consequence, attendance and progress in experimental groups, with more significant results for the direction of " Applied mathematics and Informatics».

## V. DISCUSSION

The positive influence of gamification on cognitive activity (R. M. Serikova, 2017), the development of dialogue thinking (R. S. Tsareva, 2017), motivation (T. M. Labusheva, 2017), experience and achievements of students (M. Lering, 2015), etc. However, these studies are descriptive of the order of games and their potential effectiveness.

Works on the introduction of gamification in the process of language training, for example, A. A. Fadeeva (2018), Yu.R. Guro-Frolova (2016), O. V. Orlova (2016) have a debatable nature with elements of setting gamification options. However, there are no comprehensive experimental studies of the gamification effectiveness, with the presentation of the results of the experiment. Also, there are no publications that establish differences in the response to the introduction of gamification between students of technical and managerial areas.

In this research, for the first time an increase in academic performance and attendance of students in the course of language training with elements of gamification, due to increased motivation, involvement and cohesion of students, with a more pronounced result for technical areas of training was experimentally recorded.

This effect can be explained as initially a higher communication skills of students of a direction "Management", and elements of digital technology in the game, close the direction of "Applied mathematics and Informatics", which increased interest in individual and group work last.

## VI. CONCLUSIONS

Theoretical substantiation of gamification elements introduction potential in practice of language training of students both technical, and administrative directions of preparation is resulted. The methodology of the experiment with the description of the order of organization of the role-playing game and its evaluation is presented.

For the first time, the growth of students ' progress and attendance in the course of language training with elements of gamification was experimentally registered, due to the increase in motivation, involvement and cohesion of students, with a more pronounced result for technical areas of training.

Motivation, according to the criterion of the desire to give the answer first, in the experimental group of the direction

"Applied mathematics and computer science" increased by 2.6 times; "Management" - by 1.75 times. Involvement, according to the criterion of the desire to participate in the discussion, ask questions increased: "Applied mathematics and computer science" - 2.3 times; "Management" - 1.6 times. Cohesion, according to the criterion of the desire to give explanations and help with the answer in case of difficulties for another member of the group, increased: "Applied mathematics and computer science" by 3 times; "Management" by 1.7 times.

The number of excellent grades in the direction of "Applied mathematics and Informatics" increased by 5%, satisfactory grades decreased by 8%, which allows us to recommend the introduction of gamification elements in the educational process of various areas of training of students.

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