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## 2. GAMIFICATION IN THE VET SECTOR – THE LOGISTICS LANGUAGE OPEN TRAINING PROJECT RESULTS

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**Abstract** A continuous development imperative is inherent of the human nature. Therefore, we keep making lifelong learning attempts. E-learning is helpful with the learning process because of the scarcity of free time. We might learn almost everything at almost each moment if we only want to.

The article aims at presenting results of the Logistics Language Open Training (LLOT) project related to remote logistics (inventories, warehousing, transport) teaching both in the native and foreign language. The research methods applied in the article are: a systematic literature review (theoretical

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part) and the statistical analysis of data stored by the means of the llot.eu platform between May 2017 and May 2018 (practical part).

848 users are registered in the platform (account creation) and active (provided that they have completed one lesson). The platform is dominated by users from Poland – the project leader's homeland. It is most frequent for the users to get connected with the llot.eu platform by means of a computer (84%) using mainly Chrome (56%) and Firefox (17%) browsers. An average session length is slightly more than 24 minutes. The most efficient channel of information on the LLOT project is direct meetings – conferences and fairs (72%).

The gamification mechanism makes it possible to introduce an amount of joy to such routine activities as learning. Thanks to that, we are more and more involved in performing the activities. The gamification has a potential which is presented by the LLOT project results. The gamification implementation in the llot.eu platform significantly increased the platform users' activity.

**Keywords:** *logistics courses, e-learning, gamification, vocational education and training (VET), European Social Fund (ESF)*

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## 1. INTRODUCTION

Mechanisms used in games are contemporarily observed to be transferred to the real world. These actions are intended to change human behaviors.

Games have been known to humanity since very historic times as an inherent civilisation culture element. An educational aspect of the games is perfectly known in nature – animal plays (especially young ones). This aspect is also observed among human behaviors (in this case, it is the pleasure that people take in while playing games) (Tkaczyk, 2012, pp. 11-31).

Satisfaction is provided to a human being by a play. New experiences inspire the human being, provoke the feeling of contentment (pleasure). Due to the action of exploring (discovering), we are so much attracted by games. The play success is conditioned by introducing an element of curiosity (novelty) to the play.

Curiosity is usually associated with solving a mystery or a riddle. According to the information gap theory, a human being does their best to get out of an uncomfortable situation which is described as a state in which the human being knows that they do not know a particular thing. There are a few information gap generation methods: losing ground under one's feet disrupting the basic knowledge about the world) or saying only as much as necessary (arousing interest) (Tkaczyk, 2012, pp. 65-98).

When spending our time on games, we want to know what benefit (satisfaction) we might get. In the competition (winner-loser relationship), we are both happy with our victory and with our competitor's loss. When embodying certain roles (escape), we want to be achieve personal success and get a certain status. Sometimes, we want to defeat ourselves, our weaknesses and obtain a clearing effect as implied by participating in the game (transition) (Tkaczyk, 2012, pp. 11-31).

Being conscious of the above descriptions, it is necessary to be realised how efficient educational tool games might be. Nevertheless, gamification is not always effective – negative gamification-related experiences are presented in the work by Hanus & Fox (Hanus & Fox, 2015, pp. 152-161). This is valuable because only positive gamification-related results are usually published. In the next paragraphs, one made a detailed presentation of the concept of the game application in education in theory and practice.

## **2. GAMES AND GAMIFICATION**

### **2.1. Game components**

The key game components are voluntarism and unusualness. The voluntarism in the game is shown by various attempts to omit unnecessary obstacles. On the contrary to the human logic, we often perform certain tasks in games in a more difficult way and by means of more resources to achieve satisfaction (i.e. to win the game). The game essence is shown in its freedom – the possibility to do things one's own, in any ways (trial and error method). The second component – unusualness – is related to a variety of aspects. The game should be distant from the real life to the possibly greatest extent. In this respect, narration defined as a relation between the game creator and its recipients is helpful. The narration (programme) consists of the following components:

- context (game structure – rules and constraints),
- content (content received by various senses),
- society (elements that connect the game author with its recipients and the recipients with each other),
- trade (value exchange agreed by the trade partners),
- tools (used technology).

At the very beginning, there was a simple storytelling. In the author's (narrator's) opinion, it was possible to present a given story in the possibly most attractive way when the audience had a passive attitude to the story and was only observing the story development. In this case, there was a one-direction message – the story (plot) is the most significant. The story shaping (the next narration form) relies on manipulative activities (puppet master). In this case, there is a double-direction interaction (message) which is more active and not so passive as in the first case. A set of appropriate and available tools and their management (game engines) is of key importance in the story shaping. The first narration form is to mistake in the history. Particularly in this case, it is all about immersing oneself in the game world, experiencing it to the possibly largest extent. Real social interactions are a real essence in mistaking in the history. The interactions cement the game recipients when they

are solving various real problems. The better the game environment meets the players' expectations, the more intensive the cementation process is.

There is a separate emphasis on a given place in the space and on spending time on the game that takes place in a player's mind. When entering the game world, which is governed by its own rules, one should follow its rules. The rules are defined as given norms and regulations that show solidarity of the players' society. If the rules are violated or broken, it causes sanctions and punishments to occur (Tkaczyk, 2012, pp. 11-31).

Games have their own structure. One of them must include:

- a victory condition (winning specification, the victory consists of a sum of objectives),
- objective – what is necessary to be done to win the game,
- actions – activities that a player needs to perform,
- obstacles – difficulties encountered when the objectives are being fulfilled,
- rules – limits to follow in the game.

There are various players' expectations regarding the game. Some of them tend to perfectly fulfil the game objectives. Others are fully satisfied with discovering and exploring the game world. Yet another group of players seeks for socialising with other players and contacting them. There is also a group of people that are interested in manipulating the game, influencing its course. Based on the players' expectations regarding the game, one might distinguish certain categories of players. Record breakers tend to achieve the possibly best (highest) game results. Discoverers explore the world, while trying to get to know it. Social workers consider the game as a meeting and conversational place. Killers are fascinated by having power and using its strength against other people (most frequently in a negative way). There are no pure types of players, each of us usually present a given mixture of the above types. Nevertheless, it was proven that two of these four types were of a clearly dominating kind (Tkaczyk, 2012, pp. 33-63) Hamari, Koivisto and Sarsa indicates that gamification provides positive effects, however the effects are greatly dependent on the context in which the gamification is being implemented, as well as on the users using it (Hamari, Koivisto & Sarsa, 2014, pp. 3025-3034).

The game dynamics is what motivates players to start the game. It is the game dynamics which is related to the satisfaction from the game and its attractiveness. The game dynamics is hidden in the game mechanisms. Points are one of basic prize mechanisms in games. The points reassure a player that they keep making a progress and developing. The points are a natural atavism inherent in human nature – the evolutionary willingness to break all kinds of records. Immediate feedback is the second mechanism that plays a similar role. In games, feedback is usually received more quickly than in the real life (reaction time). However, it is the connection (synergy) of points and feedback is the most powerful motivator to start games. The obtained points should be granted a higher significance that stands for levels. This happens with the pass of time. It is equal for the achievement of a particular level to obtain a given status (as in the real life). It is really important to make the status apparent because

it conditions its motivational feature. The statuses get usually materialised as a system of various badges. Besides, it is very significant for each, even the smallest, game achievement to be stippled – it is the basic addition to playing games (the prize associated with a pleasure). To achieve that, it is necessary to design a system of various challenges that would preferably include an element of randomness well known to players. The mere act of playing for oneself starts to be tedious over time. We seek for comparisons with other players and our level assessment compared to our competitors. In this case, various tables of results are a huge mechanism. The tables are created both by the game author and the players themselves. The tables are an efficient game involvement tool. In turn, a certain group of players wants to express themselves in the game to the maximum extent. In this regard, various avatars are helpful. They might be freely customised to one's own needs. Yet another group of people is driven by altruistic needs in the games. These players get points which are used to be given out and to be given to other people (altruism) as various gift forms (Kapp, 2012, pp. 25-50, Tkaczyk, 2012, pp. 65-98). In the view of Pedreir, Garcia, Brisboa and Piattini, very simple gamification mechanics such as points and badges are slightly overused elements to assess a positive gamification influence (Pedreira, Garcia, Brisaboa & Piattini, 2015, pp. 157-168) – there are other but less significant components.

## 2.2. Gamification

The gamification is the application of game elements or mechanisms in a game-unrelated environment. The gamification aims at increasing the attractiveness of performing a given activity in order to increase the level of motivation to perform it. Therefore, the gamification makes it possible to perform routine and boring activities with proper involvement. A marketing approach to gamification highlights four important aspects of gamification: affordances, psychological mediators, goals of gamification and the context of gamification (Huotari & Hamari, 2017, pp. 21-31)

At this point, it should also be highlighted that gamification is not the same as the game application. Aside from existing class teaching forms, the gamification should be considered as a complex form of teaching classes (not separate ones but the entire subject, module). As regards to game-based learning, games are treated as a teaching aid used in selected classes for the sake of experiencing and understanding the discussed topics in a more practical way. Thus, there is an explicit and fundamental difference between gamification and game-based learning. However, there is no obstacle to use games in didactics within gamification-modelled classes (operon.pl) Gamification can increase user engagement with an e-learning application and its specific tasks also (Muntean, 2011, pp. 323-329).

### **3. GAMIFICATION IN EDUCATION**

#### **3.1. Description of educational systems**

Contemporary school is still of a linear kind: there is only one right answer to each asked question and there is only one appropriate way leading to this answer. This is accompanied by the fact that the way to the right answer should be individually found. Contemporary schools resemble factories that provide education according to one rigid pattern. Such education destroys creativity and initiatives. Therefore, this kind of education is unsuitable to the labour market needs and requirements (innovative and creative employees are searched for).

In the meantime, a dramatic constant knowledge increase has been made since the medieval times – nowadays, there is nobody who has the entire knowledge about the surrounding world. We are actually inundated with the knowledge about the surrounding world on a daily basis. Therefore, the quick information selection and processing combined with the human existence multitask nature are very required features. The human existence means that one functions in a few different social roles at the same time. Additionally, highly appreciated competences are the ability to be interactive and to cooperate with other people.

Creativity is a positive inborn feature. Nevertheless, this feature starts being gradually destroyed by even higher (better?) educational system levels within the educational process. The youngest children should be considered to be the most creative. They try to make searches (errors) on their own – they are not afraid of making mistakes. These people's immanent feature is the first experience that results in creating new structures and terms in the case of a novelty occurrence. Children creativity is limitless. The children work effects are very frequently incredible and astonishing. They can make adults surprised by being able to make such things. A target direction should be a so-called lifelong kindergarten.

So-called diligent optimism is taught by games. In the game, there is always something to do. If one has done this thing, it is always possible to do it in a different way (equifinality – ease in obtaining the final result). It is the mistake mechanism (learning through trial-and-error) which is considered to be a key aspect of games. In the case of success, this aspect is a kind of an awarding factor, and in the case of failure, it is not associated with a punishing factor. During the play, there is an infinite number of attempts. It is a player who decides how much time they will spend on playing the game. The player is fully autonomous in this regard. The player's satisfaction as a pleasure taken in the game exploration is a prize for the time spent on playing it. Therefore, the contemporary educational system should make it possible for a student to have a kind of freedom or autonomy in finishing it.

The information gap theory is very helpful in fulfilling the educational objectives. A lack of knowledge is a very good stimulus to take up activities. Then, the lack of knowledge is considered to be like a mystery that is wanted to be solved. Its solution

might be of a passive type (unemotional) or an active type (emotional) but the latter one shapes more permanent stances.

Students' behaviours are conditioned by contemporary educational systems by means of a given system of prizes and penalties. In this case, a student has an opportunity to both gain and experience a loss. A competitive system in games is a system of prizes and no prizes (you will get nothing in the worst case). In this case, students only benefit from the system with no losses while going up (straight). In practice, these postulates are most frequently fulfilled by a point system functioning. Points might be awarded for being present in classes, work during them, temporary and final tests, homework and bonuses, so-called unannounced activities (surprises) that should form appropriate habits (e.g. punctuality, group work) and be favourable to modifying the behaviours.

Our attitude towards education (game) is very significant. The final effects are an aftermath (resultant) of how we influenced the recipients at the beginning of our classes (so-called mental attitude, mindset). This might have both a positive or negative character. It should be not forgotten from the educational view point that the effect of emotional contagion is transient and disappears with the pass of time.

Games are tools that stimulate us. They develop or destroy what is the best in us. Therefore, it is a challenge to appropriately select games for players. What involves us in the world of games, is their coloration and unexpectedness whereas standard school is associated with a grey and neat reality.

School is also a game. Its key attributes are:

- curiosity – new information obtainment,
- configuration of roles: teacher – students, each of them has their own subjective personality traits,
- competition – ranking of grades,
- random uncertainty – quizzes and asking questions,
- strong experiences – exams,
- prize – knowledge.

Nevertheless, school is not associated with a game, because a player has a sense of freedom in the game which is not provided by contemporary school. Therefore, a basic problem of playing a school game is no voluntarism. That is why teachers should first observe the games their students play in order to get familiar with their preferences. We most frequently use such game types at which we are the best (we have predisposition to play them). While playing, we practice and keep developing these skills. This is used to diagnosing a student – getting to know what they like and what make them nervous. Based on the diagnosis, one might make attempts to form lesson schemes appropriate for students. In these lessons, everyone will be able to show their talents (Tkaczyk, 2012, pp. 99-119).

### **3.2. Basic rules of gamification in education**

Game rules should be clear and unchangeable during the entire entertainment period because each player begins with planning their own way to fulfil the objective – to get

a prize. The "prize" question is a pivotal issue in designing gamified classes. When proceeding classes according to the gamification model, a student needs to know what the game is for. The prize should be appropriately high at the same time to appear to be attractive to the student and worth making an effort to achieve it. One should remember that the prize (benefit) needs to be larger than its achievement costs. Each of us, even a student, performs a profit-and-loss calculation. In the student's opinion, the amount of work necessary to achieve the prize should bear the hallmarks of the activity undertaking profitability and the profit must outbalance the costs. The student's holding does not decrease at each game moment or maintains at the same level or increase (as to tasks, their lack of performance or poor performance do not influence the holding). Apart from that, it is worth decomposing the main prize into a cycle of partial prizes because the more prizes the better. Each prize supports and enhances the player's habits and this leads to increasing the player's motivation to play the game. Such a situation forms work systematicity and confirms the students that they control the situation. It is very significant to make the students realise each activity they have performed properly will be awarded adequately to their performance degree (each action is profitable in a given percent). In the failure case, it is very significant to make it possible to improve the result or gain points from other activity. Besides, not so much time should pass from the activity completion moment to the prize reception moment. The student's behaviour and game continuation motivation are very strongly enhanced by quick feedback. Thus, prizes should be quickly awarded.

Positive emotions are produced by the mere game play. Therefore, the mere game participation is pleasant and it is unnecessary to win the game. When playing games very frequently, we achieve a so-called flow state (a type of trans) – full immersion in the game, time and space sense loss. This makes us function better and longer and in a more excessive way. What attracts us in games, is their attractiveness, intriguing plot, a set of activities to undertake.

From the teacher's view point, the game should be comprehensively designed as a comprehensive subject or module passing element unit. All the game rules should be clearly specified at the very beginning and cannot be changed after the game has begun. The teacher should help the students, show their own involvement in the game, quickly deliver feedback about the student's results. As for the student, the game enables freedom of exploration – the possibility to safely make attempts, mistakes and ensure the students a kind of autonomy in making decisions. Games form the ability to form one's own time management skill and the systematic work habit. The students are taught by the goal achievement way strategic planning to make choices with the consequences for the made decisions (operon.pl, 2018, module 2). A complex approach to gamification in education is presented in the article by Dicheva, Dichev, Agre and Angelova (Dicheva, Dichev, Agre, & Angelova, 2015, pp. 75-88).

### 3.3. Designing gamified classes

The design of gamified classes is performed by two methods: a top-down method (first the plot and then its decomposition into tasks) or reversely, a bottom-up method (first designing the tasks and then their mixture into a coherent plot), mixed methods are also known (simultaneous fulfillment of both approaches).

The first problem is to select a subject (module) and to figure out how many lesson hours (lessons, topics) we have at our disposal. Based to the above selection, one should form a simple and attractive plot (involving a player into a game world) – game plan. Next, one should move on to designing a list of tasks in the game for which the players will be awarded a given number of points. Firstly, the tasks should be of two types: compulsory and uncompslory (the latter one plays a role of life preservers which enables obtainment of missing credits). Secondly, the tasks should be varied (one should use a wide range of educational means). Then, certain scores should be assigned to the tasks. It is necessary to remember that the scoring system may not be misinterpreted: the sum of the number of points from the compulsory tasks should be much higher the sum of points for additional tasks. In order to get the player even more involved in the game, one should divide the subject (module) into a few stages (strengthening a systematic work habit, forcing to get to know the entire knowledge from the subject and not its selected parts). The players will get badges for the completing the stages (for getting a given number of points, not necessarily the maximum one). The signs will be used by the players as means to fulfil the game objective. What only remains, is the problem of a progress result presentation method (tables, rankings). This is not a problem due to the advancement level of contemporary ICP technologies. When all the module stages are completed, the arrangements should have been recorded in the book of results. The rules should be both as a verbal description and be enriched with a graphic depiction (game scheme). Therefore, the development of an interesting game narration (plot) is the only thing that remains to be done at the end. The game should start with an inspiring event. When the event is finished, the player should get to know the book of rules. In this gamification element, it is absolutely necessary to be obedient to the formation and adaptation rules of our own vocabulary to particular game elements (operon.pl, 2018, module 3).

## 3. „LOGISTICS LANGUAGE OPEN TRAINING” PROJECT - THEORY

The „Logistics Language Open Training” (LLOT) project, which was executed from 2015 to 2018, aimed at improving the language skills of logistic industry employees and logistic trainees. The project was co-financed from the programme entitled “ERASMUS+ KA 02 action „Strategic partnership” in the VET sector”.

The project coordinator was Poznań School of Logistics and the project partners were institutions from 3 different European countries:

- CIS – Scuola per la Gestione D’Impresa – training and consultancy company of unindustria (Italy),
- Speakeasy Berlin – privately owned language school specialized on adult education (Germany),
- Jamieson-Ball Ltd – runs a language school that specialises in English teaching within a British cultural context (United Kingdom),
- Globalnet Sp. z o.o. – educational institution mostly operates in the adult learning field (Poland).

As it can be seen, the project consortium included institutions with some experience in teaching foreign languages or in offering education in the logistics area. The experiences of all partners made it possible to develop the following project results:

- e-learning course of a foreign language (Polish, German, English or Italian) that corresponds to the B2 grammar knowledge level. The course was developed based on logistic vocabulary. All the course elements (listnings, readings, grammar, vocabulary) are performed in logistic conditions. The e-learning course corresponds to about 100 traditional classroom training hours;
- e-learning course: Inventory management in supply chain (in four foreign languages: Polish, German, English and Italian) that corresponded to 60 contact course hours in the training room with a coach, teacher or an academic. In the course, one raised such issues as demand analysis and forecasting, customer service level and inventory replenishment systems;
- e-learning course: Transport management (in four foreign languages: Polish, German, English and Italian) that corresponded to 60 contact course hours in the training room with a coach, teacher or an academic. In the course, one raised such issues as transport organisation and functioning, cargo transport preparation, formal and legal transport issues;
- e-learning course: Warehouse management (in four foreign languages: Polish, German, English and Italian) that corresponded to 60 contact course hours in the training room with a coach, teacher or an academic. In the course, one raised such issues as warehousing process and subprocesses, warehouse layouts, warehouse equipment and warehousing economy analysis.
- e-learning platform that makes it possible to perform the above courses and supports gamification (see item 4 for gamification details in the llot.eu platform in item 4).

When executing the project, one used the Content and Language Integrated Learning (CLIL) methodology. This makes it feasible to teach foreign languages and the substance – logistic contents in the case of the LLOT project at the same time. The dedicated LLOT platform users might educate their language competences in two paths:

- starting from a language course, getting new language competences within the professional (logistic) vocabulary and then testing the competences in logistic courses (getting to know them and solving tasks in the foreign language);
- starting from logistic courses, checking the users' own current language skills within the language for specific purposes, if a course participant has no sufficient skills, might move on to a language course and complete the identified lacks of knowledge.

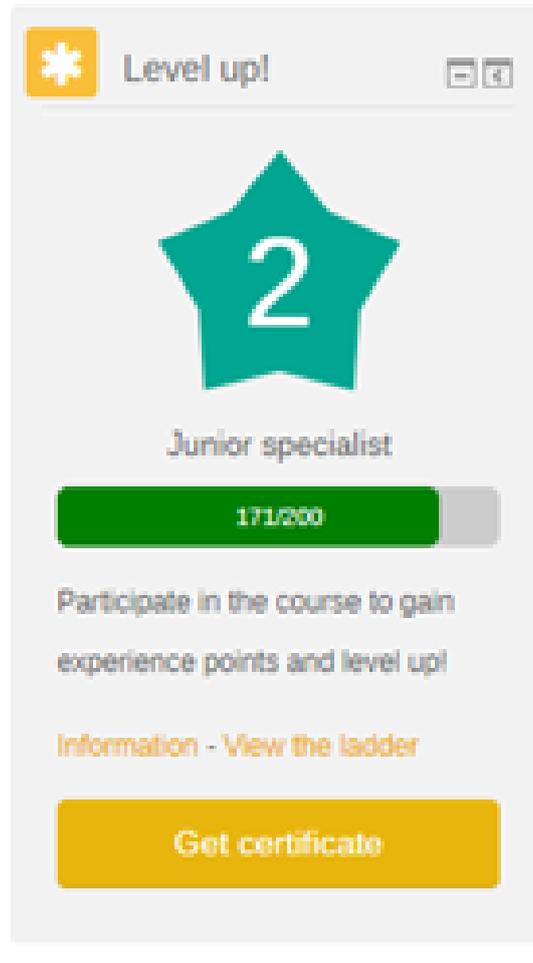
The application of modern educational tools: gamification and CLIL methodology made it possible to attract numerous users to a product on the one hand and on the other hand, to educate foreign languages for specific purposes dedicated to the logistic industry in a more efficient way.

## **4. „LOGISTICS LANGUAGE OPEN TRAINING” PROJECT - PRACTICE**

### **4.1. LLOT gamification rules**

A llot.eu platform user begins with indicating their native language in the profile (this field value might be set only once). In the future, the user will need to select either to learn a given course in their native or foreign language.

The user can see their current sign and level depicted in the panel (the user's) at each moment. The user also knows the number of obtained points with their learning progress visualisation (progress bar). An example of the llot.eu platform user's profile is presented in Figure1.



**Fig. 2.1.** LLOT platform user's profile – level, badge, points and progress

Each user can see a current ranking of players (level, points, badge, progress) for the sake of getting the users additionally motivated to become more involved in the learning process. This is how a user might assess their own position compared to others – how much they are distant from holding a given position in the collation. The llot.eu platform best users' ranking is presented in Figure 2.

Rank	Full name	Level	Experience points	Progress
1		5	1800	1800/1800
2		5	1713	1713/1713
3		5	1418	1418/1418
4		5	1412	1412/1412
5		5	1356	1356/1356
6		5	1320	1320/1320
7		5	1259	1259/1259
8		5	1234	1234/1234
9		5	1227	1227/1227
10		5	1178	1178/1178

**Fig. 2.2. Top 10 best llot.eu platform users – level, points, progress**

As part of the LLOT gamification, one provided scores for the following activities:

- passing a lesson – displaying all the slides,
- passing a module quiz – threshold of 3 out of 5 questions,
- passing a course quiz – threshold of 6 out of 10 questions.

A given number of points (see Table 1) was assigned to each of the above activities. A scoring curiosity is a multiplier of language versions. A user's successful course completion in a foreign languages is rewarded by doubling their number of points. This is intended to encourage the course users to learn a course in a language different than their native one.

**Table 2.1. Activity types in LLOT and their scoring**

Activity type	Number of points
Lesson watching	1
Credit: Module quiz	10
Credit: Course quiz	40
Multiplier of language versions	2

A user subsequently achieves particular levels in the logistic hierarchy starting from the lowest one (trainee) to the highest one (expert). This depends on the number of the obtained points. A minimum number of points to achieve a given level in the llot.eu hierarchy is presented in Table 2.

**Table 2.2. Levels in LLOT and their scoring**

Level	Minimum number of points
Expert	1000
Main specialist	600
Senior specialist	400
Junior specialist	200
Trainee	0

Once the gamification rules in the LLOT project were clearly formulated, one started the gamification in the llot.eu platform.

#### 4.2. LLOT gamification results

There 848 active users in the llot.eu platform on 21 may 2018 (when the data was collected for the sake of this article). A detailed range of the users' learning levels in the llot.eu platform is presented in Table 3.

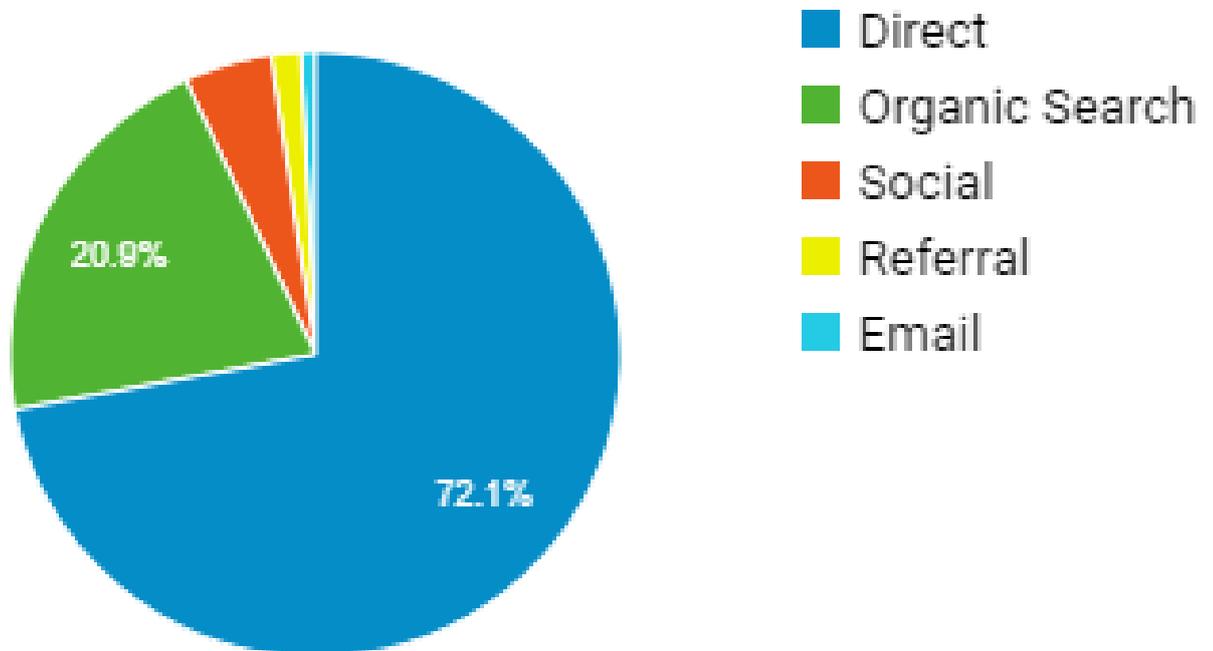
**Table 2.3. Number of users at a given learning level in LLOT**

Level	Number of users
Expert	42
Main specialist	102
Senior specialist	158
Junior specialist	313
Trainee	233

It is presented in Table 3 that most users are included in levels 2 and 1 (junior specialist and trainee). This shows that the users, who are interested in llot.eu platform (second-level users are prevailing), do not give up its further exploration. Nevertheless, the number of users at particular levels is in decline at further hierarchy ranks. On the one hand, this is implied by the gamification schedule – the highest level was achieved by the users who were active llot.eu platform users while the gamification was being started (as to others, this period has been calculated since they created their accounts in the LLOT platform). On the other hand, this might be implied by the fact that the LLOT gamification started being boring – initially attractive mechanisms stopped

being motivational with the pass of time due to the necessity to spend time on carrying on learning with making efforts.

In the next part of item 4, the LLOT project database of 848 users will be thoroughly analysed in terms of the adopted classification criteria. The first criterion is the LLOT project and llot.eu platform information sources (see Figure 3).



**Fig. 2.3. LLOT project information sources**

The pivotal information channel is undoubtedly direct communication. In this case, the power of popularising actions (LLOT project promotion) on the occasion of various logistic events (conferences, fairs, etc.) becomes more apparent. The second quite significant information channel is Internet browsers which show the llot.eu address as a result of searching for distant logistic education. In this case, it is significant to

ensure a good and high position in the list of result matches. The remaining channels (social media, referral, e-mail) play a minor role, attention should be paid to the social media impact strength in the last group of channels.

The next criterion is the llot.edu platform users' activity. There were 3.9 thousand new users in the platform within the analysed year. An annual increase is about 982.6 percent which is presented in Figure 4.

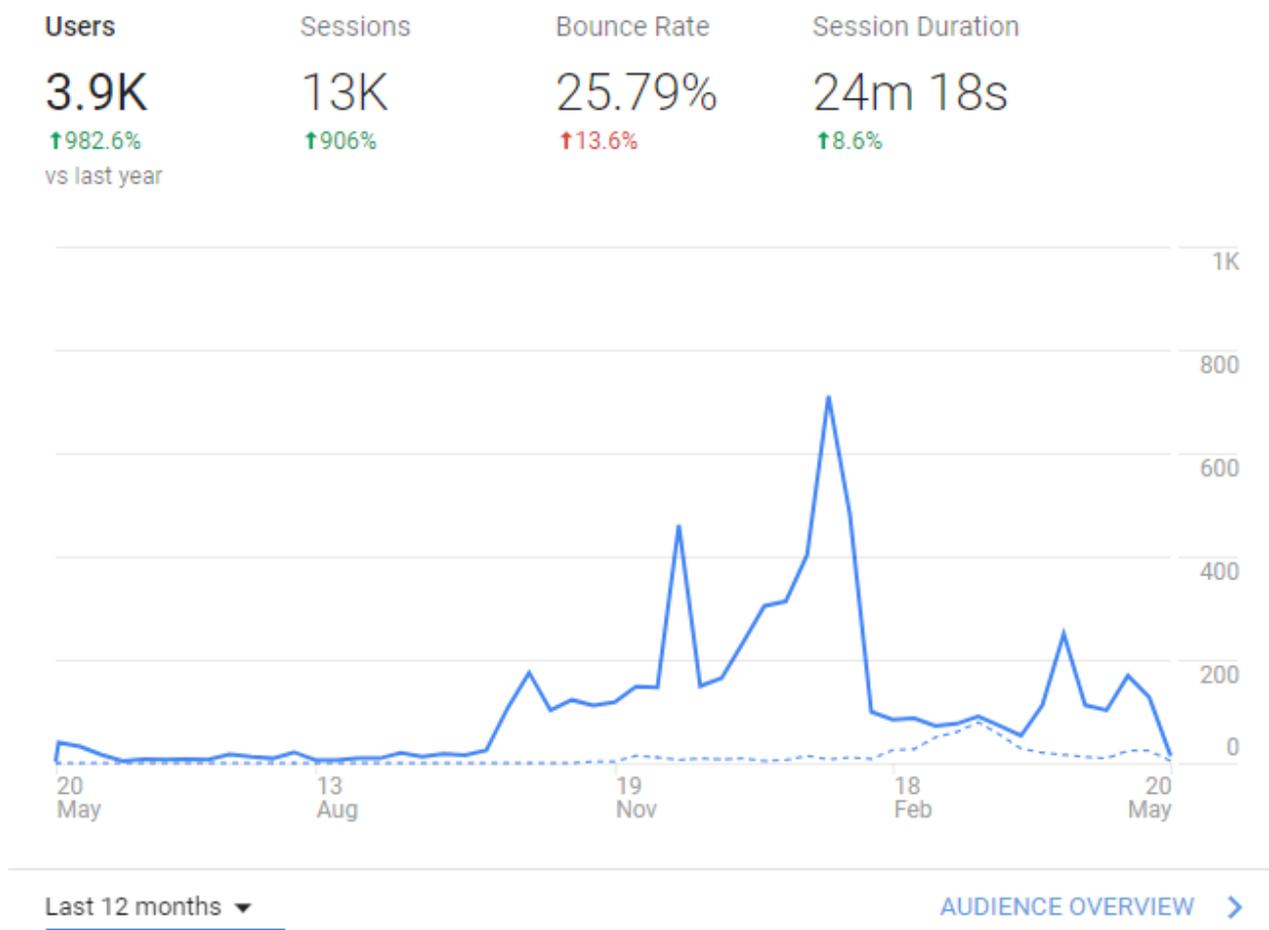


Fig. 2.4. llot.edu platform users' activity

During the analysed years, the users performed 13000 learning sessions (logins to the llot.eu platform) in total which is an increase in entries by 906 percent. Having entered the LLOT platform, a user spent 24 minutes and 18 seconds on learning on average. This result should be considered to be very satisfactory due to human psychophysical conditions related to the focusing ability. The user's stay in the platform got longer – one recorded an increase in the learning duration period by almost 8.6 percent in the analysed year. Attention is paid by the curve course in Figure 4 to this activity particular intensification at the turn of years. This might be explained by starting the gamification process and its implementation in the llot.eu platform at the turn of September and October.

An average activity of the llot.eu platform users in time units (see Figure 5) was the next criterion similar to the previous one.

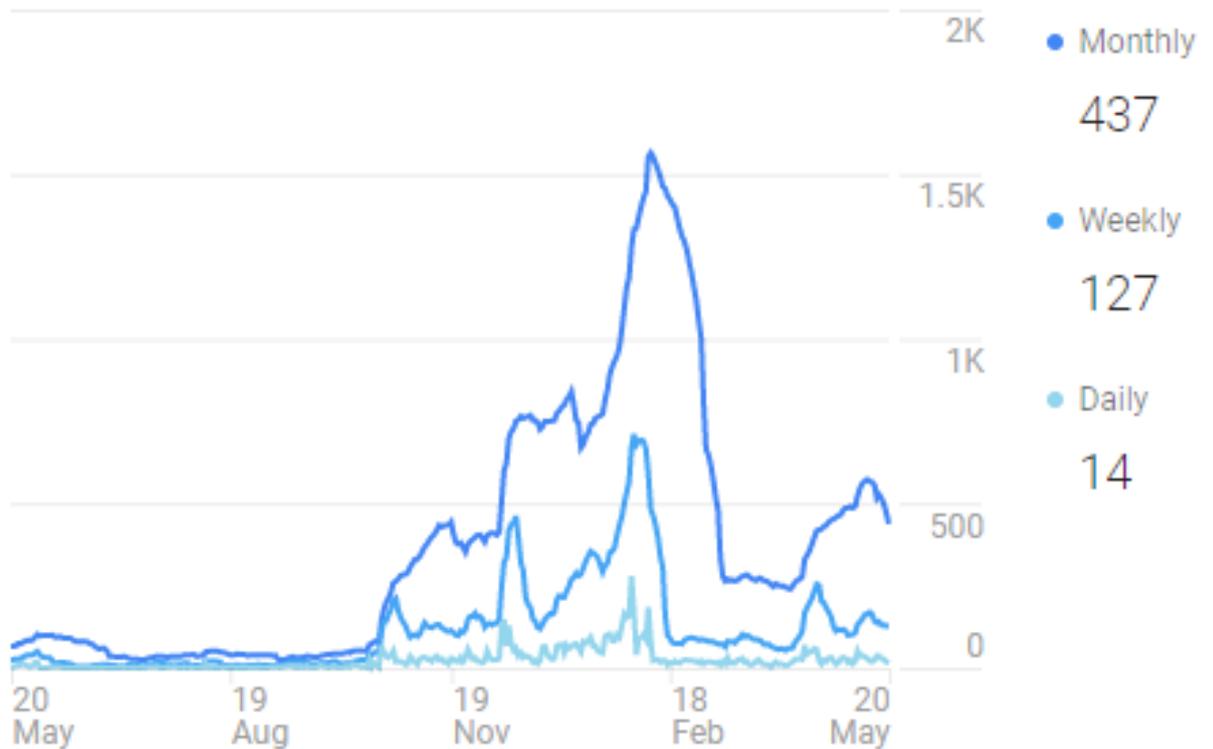


Fig. 2.5. llot.eu platform users' average activity in time units

As regards to the llot.eu active platform users in the analysed year, there were on average: 437 users per month, 127 users per week, 14 users daily. The statistical data obtainment is considered to be satisfactory due to the fact that the LLOT platform was in use all the time.

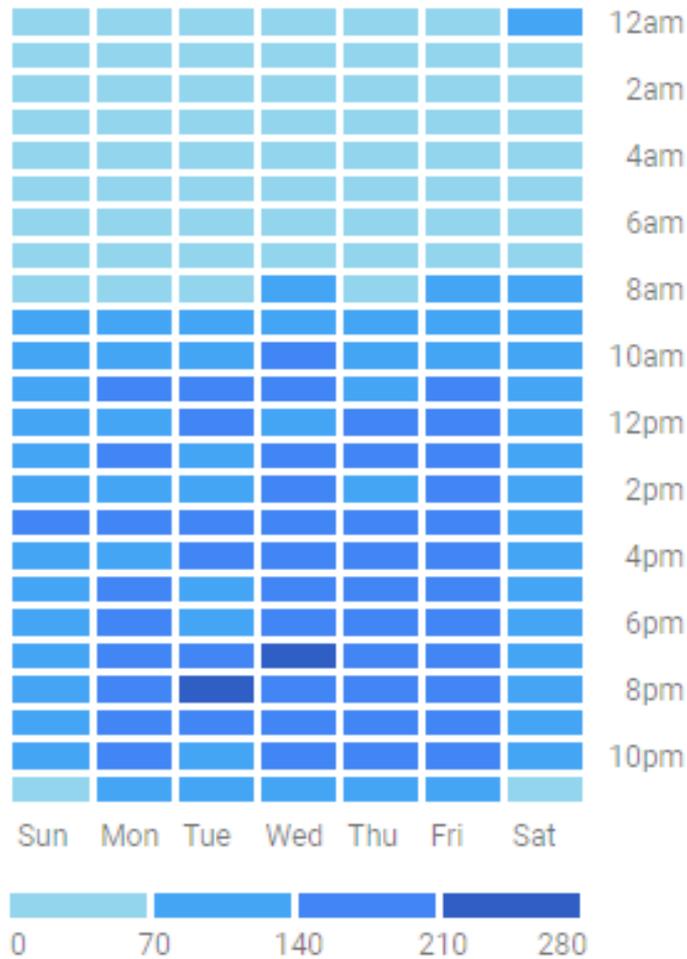
The next criterion was the llot.eu platform users' geographic appurtenance. The LLOT platform is known worldwide (all continents except for glaciers), although, remarkably, with various intensity (see Figure 6).



**Fig. 2.6. llot.eu platform users' geographic appurtenance**

Poland is a dominating country within the LLOT project. It should not be a surprise because Poznan School of Logistics (Poland) is a project leader responsible for popularising this undertaking at the possibly broadest scale. As to other countries, the number of users is distributed without apparent modes.

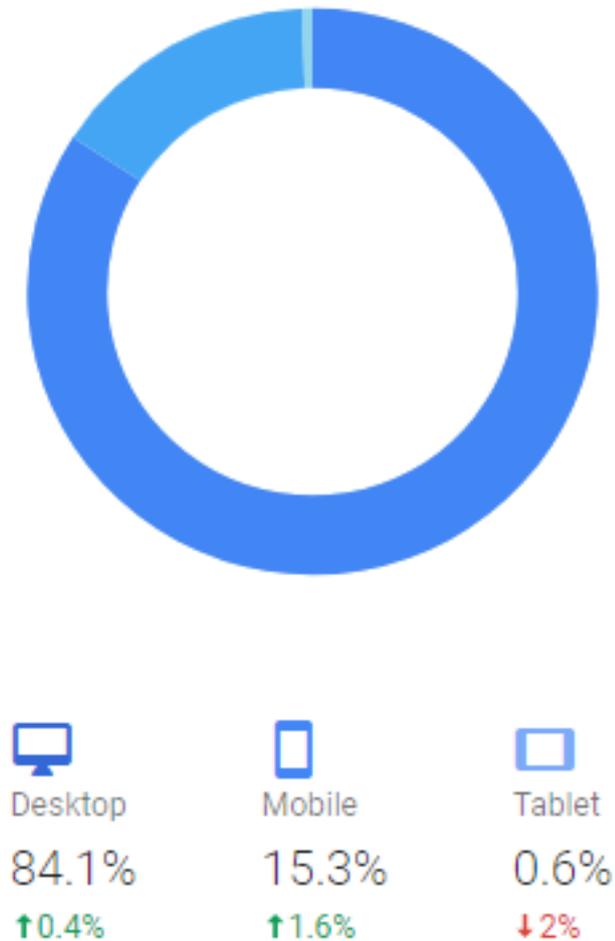
The llot.eu platform users' activity per 24 hours is the next criterion that corresponds to the previous one. The LLOT platform is mainly used from 8 a.m. to midnight (there are less users from 1 a.m. to 7 a.m.) as presented in Figure 7.



**Fig. 2.7. llot.eu platform users' activity per 24 hours**

Such an activity is implied by the time zone. Most LLOT project users are people from Central Europe. Thus, all the llot.eu platform users' activity profile is actually reflected by the daily cycle in Poland (the highest number of users). Based on the Figure 7 analysis, attention is paid to small disproportions of daily activities in the consecutive days (e.g. the higher activity intensity during work days than at the weekends is obvious).

The next criterion was a type of a device in which the course in the platform llot.eu was performed. In this case, a desktop computer is a dominating device. It is used by 84.1. percent of users as presented in Figure 8.



**Fig. 2.8. Device type used to perform the course in the llot.eu platform**

Mobile devices, for instance smartphones, are the second group represented by 15.3 percent of users. Remarkably, there is an increase in the contribution of both groups (desktop computers and mobile devices). Other device types, e.g. tablets, are used to access the llot.eu platform to a minor extent. Additionally, there is a quite significant decrease in the total share of tablets compared to competitive devices.

The next criterion under consideration was a browser type applied by a user to use the llot.eu platform. A definite leader is the Chrome browser with a 56.24 percent majority share. The second strong position is held by the Firefox browser but its share

is definitely 3-time smaller (17.06 percent). The above configuration overlaps the global, European and Polish web browser popularity collation. The preference ranking of web browsers among the llot.eu platform users is presented in Figure 9.

Browser ?	Acquisition		
	Users ? ↓	New Users ?	Sessions ?
	<b>3,899</b> % of Total: 100.00% (3,899)	<b>3,923</b> % of Total: 101.16% (3,878)	<b>13,190</b> % of Total: 100.00% (13,190)
1. <b>Chrome</b>	<b>2,195</b> (56.24%)	2,214 (56.44%)	7,983 (60.52%)
2. <b>Firefox</b>	<b>666</b> (17.06%)	672 (17.13%)	2,727 (20.67%)
3. <b>Safari</b>	<b>260</b> (6.66%)	257 (6.55%)	569 (4.31%)
4. <b>Internet Explorer</b>	<b>232</b> (5.94%)	232 (5.91%)	539 (4.09%)
5. <b>Opera</b>	<b>141</b> (3.61%)	136 (3.47%)	468 (3.55%)
6. <b>Edge</b>	<b>130</b> (3.33%)	133 (3.39%)	489 (3.71%)

**Fig. 2.9. Browser type applied by a user to use the llot.eu platform**

At the third position, there are ex aequo Safari 6.66 percent and Internet Explorer 5.94 percent. At the fourth position, there are also ex aequo Opera 3.61 percent and Edge 3.33 percent. As to other types of less popular browsers, they begin to be dominated by local tendencies – the preference variety in Poland is different than in Europe/worldwide.

## 5. CONCLUSION

People used to learn, keep learning and will be learning in the Life Long Learning era. The education tool workshop got changed as accompanied by the development of new communication forms. Formerly, there were correspondence courses, then radio or television courses and finally computer ones – but now mobile technologies – e.g. smartphones with the Internet access begin to dominate. It is confirmed by the research by Su and Cheng that students valued the outdoor learning activities made possible by the use of a smartphone and its functions (Su & Cheng, 2015, pp. 268-286).

Contemporary users are very autonomous in selecting a learning module (they decide on their own what they want to learn). Apart from that, they require comfort and elasticity in learning (learning method). Thus, distant learning, e-learning is very popular. E-learning breaks the barrier of place (I can learn any course worldwide in the place where I am), time (I learn when I have free time) and finances (distant courses are cheaper and happen to be free of charge).

Even the best e-learning course does no longer correspond to contemporary requirements. This is caused by the fact the user gets bored and their focus maintenance is decreased so fast. Gamification is helpful in this regard as it aims at introducing an entertainment element in the learning process by means of such instruments as credits, signs, rankings, etc. The gamification effect is to increase the user's involvement to learn.

The gamification implementation in the LLOT project was practically transferred to an undoubtedly apparent increase in the llot.eu platform users' activity. The project results are confirmed by the gamification potential. In the authors' view, a gradual decrease in the users' activity is implied by no formation of a more absorbing course plot (actually, no narration element) on the one hand. On the other hand, one provided no additional and bonus tasks (also with elements of slight randomness) that would strengthen the user-platform connection. The authors will keep these aspects in mind in consecutively designed gamified e-learning courses.

The readers interested in this range of topics are sent back by the authors to read the article in which the previous project results are discussed (Mizzau L., Brindani R., Adamczak M. & Cyplik P., 2014, pp. 443-451). In the project, an international approach to ICT competences in logistic education was presented.

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