GAMIFICATION IN RECRUITMENT AND STAFF SELECTION PROCESSES FROM THE PERSPECTIVE OF ENGINEERING STUDENTS AND GRADUATES

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Abstract: *The current context of the labor market reflects a significant shortage of engineers, with an impact on the industrial sector. Against the background of the demographic decline and the limitation of the educational offer, there is an increased interest of companies in hiring students and graduates from the engineering area.*
Hiring young people, attracting them to a professional career, and creating a working environment in companies that motivates and convinces them to invest energy, time and passion in performing professionally as early as possible is not only essential, but also critical.
The relations between the employee and the employer are changing, the labor market is in a continuous process of transformation, and the human and the digital part must be included in this process.
The use of some innovative, digital tools for recruitment, performance evaluation and learning, such as gamification, is becoming a challenge and a necessity for companies in their desire to create a pleasant experience for the employee from his first contact with the company.
The long-term goal is to strengthen their effective involvement in the company's activity, increasing the retention rate of valuable employees. Many companies, especially in the technology industry, give applicants the opportunity to play during the hiring process and, as a result, increase their chances of finding a job according to their skills, qualities and ability.
The work includes a qualitative research that followed the degree of familiarization of students and recent graduates of UNSTPB (National University of Science and Technology POLITEHNICA Bucharest) with the concept of gamification in the recruitment and selection processes of personnel, and the understanding of how online applications, developed around this concept, should be designed to be of interest to them.

Keywords: *gamified assessments, game-based assessments, recruitment platform through gamification*

INTRODUCTION

The staff shortage in Romania remains a major challenge for the business environment in 2023 as well, forcing the HR departments to focus on maximizing the retention indicators.

According to the data for the beginning of 2023 on the BestJobs platform, the fields with the most job offers, but also the most employments, were Sales, IT/Telecom, Engineering, Finance/Accounting and Production/Logistics. The shortage of specialists still remains a problem in IT, Health and Technical area. [1]

The shortage of the specialists in the area of engineering is also mentioned by the rector of UNSTPB (National University of Science and Technology POLITEHNICA Bucharest), the largest technical university in Romania, who indicates that in the next ten years, 600,000 engineers from various fields will be needed on the local market. The demand for engineers is so great that 80% of the graduates of the Politehnica University of Bucharest work before finishing their studies. [2]

The total number of engineering graduates in 2023, from Romania, is 35% lower compared to the market needs, and UNSTPB manages to cover only 60% of the companies' HR requests. [2]

Advances in technology, new tools, and expanded connectivity have made virtual recruiting an important part of the HR departments' efforts to hire faster. Globally, 75% of potential job candidates are not actively looking for a job, but would be open to greater opportunities. Labor force participation rates in job postings have fallen to 61.4 (from 84% before the pandemic), causing a continuing labor shortage. [3]

A novelty on the post-pandemic labor market is the emphasis on technology. Many companies have adopted digital HR solutions to support hybrid and remote work, but digitization has also reconfigured the recruitment process. The challenge is for companies to identify new digital ways to increase the efficiency of the processes without profoundly affecting the human relationships, going so far as to replace them.

A study conducted by Gartner, in which more than 800 HR leaders were interviewed, reveals the priorities that human resources managers had in mind for the year 2023. Thus, regarding the recruitment, it was stated that a percentage of 46% of the human resources managers who participated in the study claimed that they would pay more attention to the recruitment process. Also, a percentage of 36% of the respondents declared that their main challenge at this moment in terms of the recruitment process is represented by the fact that they do not have enough resources to find candidates who possess the skills they need in the company.

Another trend is the search for non-traditional candidates. Thus, to fill critical roles in 2023, organizations will need to be more comfortable evaluating candidates based solely on their ability to fulfill those roles, rather than their references and previous experience. [5]

THEORETICAL ASPECTS

Games are part of the human experience. When people play, they enjoy it, become more motivated and interact more deeply. More and more, games are finding use in a wide range of contexts reaching the business world as well. Gamification means using games in contexts that are not traditionally game-related. The goal is to introduce fun into the workplace while allowing for the completion of the day-to-day activities.

The advantages that introducing games into the workplace can have [6],[7],[8],[9],[10],[11]:
  ➢ *Improving remote working* and getting closer to colleagues through the opportunity to experience more fun, work activities leading to better work engagement.
  ➢ *Increased engagement and productivity*: 90% of employees are more productive when using gamification; this is because gaming motivation increases the engagement by 48%;
  ➢ *Increased happiness*: 89% of the employees say gamification makes them feel more productive and happier at work.
  ➢ *Improved retention*: 69% of the employees plan to stay with their existing company for more than three years if they use gamified activities.
  ➢ *Enhancing collaboration*: The opportunity for the employees to work together in friendly and easy circumstances can increase the enthusiasm for collaboration.
  ➢ *The contribution of technology* allows the processing of a large volume of data. They can be processed, recorded and analyzed by the employer.
  ➢ *Effect of encouraging the employees* to share job information with their friends through their social media.
  ➢ *Overall*, these benefits lead to 147% better performance compared to companies that don't use gamification.

The disadvantages are the following:
  ➢ *Approximation of the reality*: How players perform their roles in the game is only an approximation of how they might perform their actual professional roles. [12]
  ➢ *The multitude of psychological test alternatives* developed based on scenarios or contexts that *may be irrelevant* or miscommunicate the role requirements to potential job applicants. [13]
  ➢ *The challenge is to find meaningful relationships between process data* containing e.g. mouse clicks, reaction time, navigation paths, etc., presented in the log files *and their relationships with the aspects to be measured in the real life*. [14]
  ➢ *The negative attitude* of those who have no previous gaming experience and do not associate gamification in a high-stakes context, such as the employment, as a serious approach. [12]
  ➢ *Topics related to gender equality and accessibility for people with disabilities have not yet been adequately researched*. [15]

Most companies still use traditional techniques of recruitment and selection, training and development for the employees. Thus, there are challenges related to long hiring cycles, high hiring costs, difficulties in understanding the

employer's requirements and the organization's culture before appearing in a formal interview, low retention after hiring, low visibility of the recruitment process. [16], [17].

Many companies, due to the lack of the resources, outsource the recruitment and selection process to specialized companies where the commercial interest of these companies intervenes and the lack of the involvement for solutions adapted to the needs of the client, adopting measures related to the standardization from the desire to obtain economies of scale. Unfair practices appear, namely asking candidates to modify their CVs according to the client company's job description, even if the candidate's profile is not synchronized with the declared job profile.

Outsourcing services related to the procurement and management of human resources, keeping only minimal HR services within the company, can lead to the loss of the trust and commitment of the contract workers towards the organization. Thus, the organizational culture is affected, the phenomenon of the employee alienation appears, and the process of bringing back the outsourced human resources services inside the company is long and expensive. [18]

Some firms are approaching the recruitment process with gamified experiences, supplementing or eliminating the traditional path, namely the job opportunity web page with a brief job description, generating more interest from the candidate and ultimately providing much more information to the staff involved in the recruitment and selection.

Gamification in recruitment is not an entirely new trend, but this is one innovation that greatly increases the employee engagement. It offers leaderboards, rewards and badges (either virtual or physical) that can be used to improve candidate attraction and training.

Gamified Assessments vs. Gamebased Assessments

Gamified Assessments refer to evaluations of a classic design, where individual elements from games are superimposed without changing the core of the assessment. Game elements are used to increase acceptance of the classical testing procedures. Avatars can be used here to accompany applicants from one task to another and to explain something to them. Progress bars, sounds or stories are used. This does not change the actual tasks and the build follows traditional test build principles. Classical quality criteria for diagnostic procedures may be used here without restriction or claim. [15], [19]

Gamebased Assessments are evaluations whose basic design principle corresponds to that of a game. The performance is the subject to game elements such as: sound, rounds, scores, avatars (playing characters), moving elements, 3D simulation, etc. The focus is on the entertainment of the participants. Classical quality criteria can only be applied to a limited extent and there is a question of acceptance, because it is difficult to build test games that measure validly and, at the same time, clarify to the candidates what they are dealing with, the job for which he / she is currently applying. [19]

Jobful - the first gamification recruitment platform in Romania

Candidates build their profile by testing their skills and solving challenges, and companies find the candidates they need much more easily, without having to filter dozens of unsuitable CVs. With Jobful, companies can develop their own talent pool, minimize screening time and generate shortlists of the most suitable candidates in seconds using the artificial intelligence, and offer specialized training to develop the skill set of the pool of talent according to current and future needs. [20]

Jobful is a platform that offers advantages to companies in that the integration of a new employee into the organization will be easier and with much more important results over time, and financial gains, and the candidate is the subject to a process of learning, of accumulating information, following the way in which he/she progresses in the acquisition of the knowledge. [21]

Quizzes on Jobful are not intended to test specific skills, such as image or video editing, but rather to give the employers a general idea of an applicant's personality and help them decide if he/she is a good fit for the job he/she has in mind for whom he/she applies.

Candidates can accept or decline invitations to various opportunities on Jobful, with their personal data protected until they accept. The platform provides pre-testing capabilities to ensure applicants are prepared in addition to the gamification framework they are building and keep them engaged in the process. They have the option of going to academies, where they can study and improve general skills (such as: communication, critical thinking, integrity, emotional intelligence, teamwork, etc.). With the gaming experience, they can evaluate their skills and accumulate points, which can eventually turn them into advantages. [21]

In the platform the assessments are timed and a final exam usually consists of 40-50 questions with an answer period of 90 minutes. Jobful provides the company with a list of names and a percentage of matches, after the candidate completes all the exams and employers start looking for him. The criteria used to create this list were set by the company, and it can select criteria such as: years of experience, skills, foreign languages known, skills, education, etc. There is no name, contact information or email address in candidate profiles. A company must send an invitation if it is interested in a particular person. The applicant finds out via SMS and e-mail that a certain company wants him/her for a certain position, and has 48 hours to respond, if he/she is interested in continuing the collaboration. If both parties communicated, Jobful would also receive payment. These "fits" are the foundation of the startup's business strategy. Candidates do not pay to use the platform, but employers are required to purchase specific packages that include a number of matches. [21]

In the last four years, the Jobful team has managed [20]:
➢ to participate in the Spherik Acceleration Program by KPMG and obtained 3rd Place and the Popularity Award at Startarium, in 2018;
➢ to graduate from the Acceleration Program SAP.io Berlin, in 2019;
➢ to graduate from the NUMA Acceleration Program (WEVE) New York, in 2020, while in 2021, it completed the InnovX Scale-up Acceleration Program and participated in the Lion Empire;
➢ to be selected by the European Bank for Reconstruction and Development for the Star Venture program, offering specialist consultancy for key development projects, in 2022.

To date, Jobful has managed to establish strategic partnerships with technology companies such as Microsoft, SAP, Oracle and AWS, as well as financial institutions, such as BCR/ERSTE and EBRD. In addition, it registers a client portfolio of over 300 companies. [20]

METHODOLOGY

The need to attract and retain better employees compared to competitors is for many organizations a strategic priority. Thus, more and more companies use different gamification tools to improve the processes of recruitment and selection, training and development of employees, experience gained in team-building, talent management and performance management.

The problem in mind: Although gamification in recruitment is not a completely new trend on a global level, it has existed in different forms since 2010, the hiring companies in Romania are at the beginning of the road with the implementation of this concept at a high level, and the difficulty encountered at this moment it is to promote the concept especially among young students and graduates.

The work is based on an exploratory qualitative research, the purpose of the research being to track the degree of the familiarization of the students and recent graduates of UNSTPB with the concept of gamification in the recruitment and selection processes of personnel.

The main objective of the work is to understand how online applications, developed around this concept, should be designed to be of interest to young students and graduates.

The method approached was the in-depth interview. Sixty-five interviews were conducted, and the duration of an interview was 20 minutes. The respondents were divided as follows: 19 students enrolled in the bachelor's study programs, 21 students enrolled in the master's study programs and 25 graduates from three faculties within UNSTPB. Distribution by gender: 36 respondents being women and 29 men. Depending on the age category: 11 respondents are between 18-20 years old, 23 between 21-23 years old, and 31 between 24-26 years old. The vast majority, 48 respondents, were or are employed, and 22 of them having several jobs over time. In the last two years, 48 of the respondents were actively looking for a job.

RESULTS

From the analysis of the interviews, it was highlighted that 25 respondents are very or quite familiar with the concept of gamification, the remaining 40 being little or not at all familiar. The concept of gamification is known to them from the media (28%), from college (28%) and from books (3%).

To the question, "*Do you have knowledge about how gamification can be used in various fields? If yes, specify in which fields you have encountered this concept!*", 26 respondents also mentioned the field of the human resources among other fields.

When asked, "*What do you mean by the term "gamification" in the context of the recruitment and candidate selection*?", 63% of the respondents made the connection with the use of game elements in the process to engage and motivate candidates; 17% considered a recruitment strategy based on video games; 24% considered a system of evaluating candidates through the online competitions.

80% of the respondents believe that gamification can be an effective method to a large and very large extent in the process of recruiting and selecting candidates. Only 3% of respondents consider it to be an ineffective method. Among the arguments brought for the effectiveness of the method were mentioned:
- "the new generation is more efficient when playing";
- "the employer can more easily identify suitable candidates for the targeted position";
- "would manage to eliminate moments of tension";
- "it would motivate candidates to apply for more jobs and learn various things about the company";
- "could replace a possible practical test of the employment interview";
- "it can be seen the skills of the candidates in relation to the team";
- "candidates are much more involved and present through the games", "through different games the strengths and weaknesses of the candidates can be evaluated",
- "it can put the candidate in a real situation, presented in the form of a game";
- "different abilities can be tested";
- "it is important because through different games the level of skills can be seen";
- "it can be fun for the candidate";
- "an interactive and interesting way",
- "by transforming some lessons or various courses into authentic game situations, young people get actively involved, thus becoming able to understand and retain the information presented much more easily";
- "there is the Jobful app, for example, which does this successfully";
- "today's young people are more used to video games than simple job interviews, so I think it will be much easier for them to go through a game than to be interviewed directly by the employer";
- "playing" is the simplest and most intuitive thing that a person experiences from a very young age and it is easy for him/her to use this method to experience new things";
- "playing is more fun, especially when there is a goal in the middle";
- "you can select candidates through games related to the ability to adapt to the problems/situations to which he/she is exposed in the game, based on which it can be offered qualifications for each",
- "it can bring some efficiency, by the fact that applicants will be attracted by news. If this method becomes normal, applicants will have the same interest as for the current methods";
- "it can be fun for young people because they are familiar with video games and the digital environment";
- "develops thinking and the way to make connections";
- "it is a new concept that attracts young candidates".

It is interesting that there were also a few opinions, not many, that mentioned that "it is not a good criterion for choosing employees" or "not all candidates are willing to take part in such practices". 62 of the respondents (95.4%) are of the opinion that gamification could bring added value to the candidate selection process.

Among the skills that could be developed more effectively through gamification in the recruitment process were mentioned:
- decision-making (70.8%);
- adaptability (70.8%);
- critical thinking and problem solving (66.2%);
- planning (61.5%);
- time management (60%);

- creativity and innovation (58.5%);
- collaboration and teamwork (53.8%);
- emotional intelligence (53.8%);
- communication (43%);
- conflict management (41.5%).

To the question "*Why do you think that developing these skills through gamification in the recruitment process would be beneficial for you as a young job seeker*?" the answers mentioned the fact that:
- ➢ "I can find a job according to my skills";
- ➢ "it can help me integrate better in the company and can represent an advantage over the other candidates";
- ➢ "ensures in-depth knowledge";
- ➢ "would facilitate team work";
- ➢ "there is always room for improvement, so I can develop a series of skills that are helpful in everyday life";
- ➢ "I could discover new skills";
- ➢ "I would see the whole process much more flexible than the rigid method applied by some companies";
- ➢ "it would help in my personal development in a fun way";
- ➢ "the skills developed as a result of this process will be beneficial for the future";
- ➢ "helps me get hired more easily";
- ➢ "certain skills can be developed that are sought at work and that cannot be developed at college or in social life";
- ➢ "these skills can meet the company's needs and thus provide more opportunities for employment";
- ➢ "it can increase the chances of employment at a larger company".

The skills that respondents consider they still have to work on and gain knowledge on are:
- risk tolerance (50.7%);
- leadership (41.5%);
- conflict management (40%);
- creativity and innovation (38.5%);
- planning (37%); adaptability (35%);
- emotional intelligence (35%);
- decision making (34%).

It is also interesting that the respondents believe that they possess good and very good skills for critical thinking and problem solving (78.4%); the ability to set priorities (73.8%); integrity (69.2%); collaboration and teamwork (67.7%); time management (67.7%).

86.2% of the respondents would be interested in actively participating in the testing and development of personal skills through a recruitment platform based on gamification. 95.4% of the respondents believe that developing skills through gamification in the recruitment process can bring advantages in the professional career.

To the question "*What are the main aspects you consider important in how a gamification-based recruitment and selection application should be designed?*", the following aspects were mentioned:
- ➢ "captivating application, generating positive emotions, using attractive visual and auditory elements" (75.4%);
- ➢ "easy accessibility of the application by different devices" (66.2%);
- ➢ "intuitive application, tasks clearly stated" (58.5%);
- ➢ "fun, relaxing app" (58.5%);
- ➢ "the clear connection between the game tasks and the intended job" (58.5%);
- ➢ "explaining, at the end, the reasons why a candidate is or is not suitable for the position" (56.9%);
- ➢ "transparency, open communication regarding the purpose and use of the data obtained by the recruiter in the online interaction with the candidate" (53.8%);
- ➢ "reduced duration of the game tasks" (49.2%);
- ➢ "visible offer of the vacant jobs, for which one can compete" (49.2%);
- ➢ "the existence of the feedback during tasks" (43.1%);
- ➢ "the possibility to compare the score obtained with other scores obtained by other participants" (43.1%);
- ➢ "the existence of the support functions (e.g. audio recordings or visual aids) to simplify the understanding of the work tasks" (41.5%);
- ➢ "the avoidance of the negative emotions among users through design errors (bugs)" (36.9%).

Only 6% of the respondents were able to name a recruitment and selection platform based on gamification, and that was Jobful.

34

Finally, 95.4% of the respondents expressed their interest in applying in the future, if they have a choice, for a job through a recruitment platform based on gamification over a traditional platform.

CONCLUSION

Attracting candidates is becoming increasingly difficult for the recruiters. Thus, the innovative approaches have emerged, whereby companies replace or supplement the usual way of the recruitment and assessment with recruitment games and game-based assessments carried out in the online environment.

Such an innovative approach is the Jobful platform, a Romanian start-up, which, based on the changes required by the young generation regarding the preferences and expectations generated by the recruitment and selection process, comes up with a solution that constantly attracts investments. Thus, in the year of establishment 2019, Jobful received the first round of Angel investments of EUR 100,000, which was followed by another EUR 600,000 in subsequent investment rounds. At the moment, Jobful has reached 150,000 Euros in annual recurring revenue and now averages 60,000 Euros of new business every quarter. All of this is happening in a global market valued at more than $140 billion at the end of 2022, the global market for talent acquisition, employment technology and related services is estimated to grow to more than $196 billion by 2028. [20]

The paper highlights the fact that there is a real interest among the students and graduates of higher studies within UNSTPB for the concept of gamification applied in the recruitment and selection processes of staff, their expectations being a starting point for how such dedicated applications should be designed.

The shortage of young specialists still remains a problem in IT, Health and Technical area. Thus, employers must make better use of the advances in technology, new tools and extended connectivity, invest in Jobful-type applications in order to hire faster, less expensively and with better results over time. The young candidates who feel more involved, more motivated, less stressed in the performance evaluation process through fun activities and achievements in the online environment are also successful.

Of course, it remains that this approach in the recruitment and selection process does not completely replace the stages of the process, but rather helps where there is interest from the candidates for such an experience, possibly preceding a classical approach to the process. There is also the issue of keeping jobs in the HR area, of specialists who may be threatened by the existing technological developments and offering equal opportunities to those young people who do not have experience and proven skills in computer games and do not see this as a serious approach in a relationship with an employer.

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