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Perception of the Higher Education in Digital Games by Slovak High School Students

ABSTRACT

The gaming sector is currently, with about 3 billion gamers worldwide, one of the best developing segments in society, not negatively affected even by the COVID-19 pandemic. As the interest in working in this sector increases, so does the interest in higher education in this field. Although the first steps in establishing game studies on the academic grounds date back to the 1980s, this study field institutionalization beginnings can be talked about since 2000 with occurring the ludology definition and the emergence of the first game-oriented scientific journals. Despite the difficult start, in the present, studying digital games is not so limited, partial as well as full degree study programs appear at universities all around the world, but high school graduates are often not aware of these options, even in their nearest surroundings. The study aims to identify the level of awareness of the possibilities within higher education in the field of digital game studies and to determine the attitudes of potential future university students to this field of education in Slovakia that in recent years has significantly eliminated the gap between the level of the Slovak and the Western (or world) gaming sector after the fall of the Iron Curtain. In the study, the authors respond to the three main problems via research completed with a representative sample of respondents. Data show that the level of awareness about these study options if is insufficient, but not lower than the awareness about other study programs. The discovered attitudes are of little consistence and their valency tends from neutral to slightly negative. However, statistics show that respondents perceive the study program of digital gaming as potentially pleasant and at the same time, there is a significant correlation between playing digital games and displaying positive attitudes towards potential studying of the field in the target group.

KEY WORDS

Attitudes. Digital Games. Game Studies. High School Students. Higher Education. Perception.

1 Introduction

Although the first forms of what is now called digital games began to appear in the early 1960s (*Spacewar!*¹ from 1962 is considered the first “digital” game), the study of games started to frame much later, in the 1980s, within other academic disciplines. The author of the first dissertation focused on computer games (entitled “What Makes Things Fun to Learn? A Study of Intrinsically Motivating Computer Games”) from 1980 was the student of psychology.² The possibility of the game studies existence as a field of humanities was predetermined by the first conference focused on games, “Video Games and Human Development”, which took place at Harvard University in 1983.³ In the following period, authors tried to explain the theory of digital games based on the research of other media (e.g., drama, theatre, film), which led to a dispute between game scholars and narratologists regarding the study of games only through a scope of methodological approaches of narratology.⁴ In 1999, G. Frasca used the term *ludology* to describe the multidisciplinary discipline of studying games and playing separately from narratology but partially utilizing its approaches.⁵ According to M.-L. Ryan, the creation of ludology did not mean to ignore narratology in the context of games study and research, but the creation of a discipline that required “to expand the catalog of narrative modalities beyond the diegetic and the dramatic, by adding a phenomenological category tailor-made for games”.⁶

Game studies, more commonly used term for ludology, as a viable academic field were considered since 2001 when the first international scholarly conference was held in Copenhagen, and universities started to offer graduate programs in game studies for the first time.⁷ F. Mäyrä defines current game studies as “a new academic field and interdisciplinary field of learning, which focuses on games, playing and related phenomena. Its recent rise is linked with the emergence of digital games as a cultural force, but it is not restricted to any technology or medium”.⁸ However, the establishment of game studies in academia has been slow and very unequal in individual parts of the world because different geopolitical conditions have influenced the level of the gaming sector development as well as the overall cultural perception of digital games. Regarding Slovakia, then Czechoslovakia, it was a part of the Eastern Bloc, as a socialist country behind the Iron Curtain, until 1989, which slowed down the development of the gaming sector in this region. While the neighboring countries such as Poland and the Czech Republic managed to reach back the level of the Western world in this regard faster, in Slovakia, the development of the gaming sector started to escalate more significantly only in 2007 with newly established game developer companies (e.g., Pixel Federation).⁹ At present, the level of the Slovak gaming sector is notably closer to the general standard, and also many attractive job opportunities for young people related to it.

¹ RUSSELL, S.: *Spacewar!*. [digital game]. Cambridge, MA : S. Russell, 1962.

² AARSETH, E.: Meta-Game Studies. In *Game Studies*, 2015, Vol. 15, No. 1. [online]. [2022-07-22]. Available at: <<http://gamestudies.org/1501/articles/editorial>>.

³ MAGO, Z.: Úvod do štúdia digitálnych hier I. Trnava : FMK UCM, 2020, p. 10.

⁴ For more information, see: AARSETH, E.: *Cybertext: Perspectives on Ergodic Literature*. Baltimore, MD : The Johns Hopkins University Press, 1997.; FRASCA, G.: Simulation versus Narrative: Introduction to Ludology. In WOLF, M. J. P., BERNARD, P. (eds.): *The Video Game Theory Reader*. London, New York, NY : Routledge, 2003, p. 222-225.

⁵ FRASCA, G.: Simulation Versus Narrative: Introduction to Ludology. In WOLF, M. J. P., BERNARD, P. (eds.): *The Video Game Theory Reader*. London, New York, NY : Routledge, 2003, p. 336

⁶ RYAN, M.-L.: Beyond Myth and Metaphor – The Case of Narrative in Digital Media. In *Game Studies*, 2001, Vol. 1, No. 1. [online]. [2022-07-22]. Available at: <<http://gamestudies.org/0101/ryan/>>.

⁷ AARSETH, E.: Computer Game Studies, Year One. In *Game Studies*, 2001, Vol. 1, No. 1. [online]. [2022-07-23]. Available at: <<http://gamestudies.org/0101/editorial.html>>.

⁸ MÄYRÄ, F.: *An Introduction to Game Studies: Games in Culture*. London : SAGE Publications, 2008, p. 11.

⁹ MAGO, Z.: Úvod do štúdia digitálnych hier I. Trnava : FMK UCM, 2020, p. 38; For a more historical background of the development of the gaming sector in Slovakia, see: ŠVELCH, J.: *Gaming the Iron Curtain: How Teenagers and Amateurs in Communist Czechoslovakia Claimed the Medium of Computer Games*. Cambridge, MA : MIT Press, 2018.; KABÁT, M. et al.: Pen & Paper & Xerox: Early History of Tabletop RPGs in Czechoslovakia. In *Acta Ludologica*, 2022, Vol. 5, No. 1, p. 102-117.

The number of gamers all over the world is increasing at a dizzying pace. While in 2015, when the first accredited study program in the field of digital games, or game studies in general, was established in Slovakia, there were less than two billion players worldwide, by 2022, their number rose to 3.2 billion, with a total value of the global game market of almost 200 billion USD.¹⁰ A society, in which new entities of digital game development have been rapidly established, including countless independent game developers, must respond to these facts in several spheres, one of which is the higher education. Particularly, when university education in game studies is now more available and nearer than ever, even in Slovakia.

Besides mentioned fully accredited study program at the University of Ss. Cyril and Methodius in Trnava (and opportunities to study relevant fields, programs or subjects abroad), there are more recently created games-oriented bachelor programs at the Academy of Performing Arts and the Academy of Fine Arts and Design in Bratislava, and the game design laboratory GAMElab at the University of Žilina.¹¹ The question is, if interested in applying in the gaming sector in the future, to what extent are high school students aware of their options to actually study the field of digital games within higher education at all, and not just commonly known related fields, like programming at the computer science study programs, and what are their attitudes towards it, especially if relevant education has never been a condition to apply in the gaming sector? The study, therefore, aims to identify the level of high school students' awareness of the possibilities within higher education in the field of digital game studies and to determine their attitudes to this field of education in Slovakia.

2 Methodology

2.1 Objectives and Research Problems

Inspired by the facts described in the text, we set the following research aims: To identify the level of awareness in the target group about the options of acquiring qualification in the frame of higher education in the field of digital gaming¹² and to discover the attitudes¹³ of potential future university students toward this study field in Slovakia. Consequently, we formulated the following research problems (RPs):

RP1: How high is the level of awareness about the options of acquiring of qualification in the frame of higher education of digital gaming studies in potential future university students (respectively, the students of the last three years of high school and grammar school studies) in Slovakia?

¹⁰ WIJMAN, T.: *The Games Market Will Show Strong Resilience in 2022, Growing by 2.1% to Reach \$196.8 Billion*. [online]. [2022-07-22]. Available at: <<https://newzoo.com/insights/articles/the-games-market-will-show-strong-resilience-in-2022>>.

¹¹ *Ako na Slovensku študovať tvorbu videohier? Tu nájdete odpoveď*. [online]. [2022-07-25]. Available at: <<https://sgda.sk/education/>>; Digital competences of teachers are discussed in: GÁLIKOVÁ TOLNÁIOVÁ, S.: On Perspectives of Teacher Training and Understanding of Their Digital Competencies as Determinants of Digital Education. In *Media Literacy and Academic Research*, 2021, Vol. 4, No. 1, p. 119-130.

¹² Regarding the fact that during the time of realization of this research, there was only one registered and accredited study program in the field of digital gaming, all of our data is narrowed to the study program of *Theory of Digital Games* at University of Ss. Cyril and Methodius in Trnava.

¹³ We depart from the tripartite perspective of attitude valency: *actional* (behavior), *informational* (cognitive), and *emotional* (affective). See, e.g. SMITH, M. B.: The Personal Setting of Public Opinions: A Study of Attitudes Toward Russia. In *Public Opinion Quarterly*, 1947, Vol. 11, No. 4, p. 507-523.; KATZ, D., STOTLAND, E.: A Preliminary Statement to a Theory of Attitude Structure and Change. In KOCH, S. (ed.): *Psychology: A Study of a Science: Vol. 3 Formulations of the Person and the Social Context*. New York, NY, Toronto, London : McGraw-Hill, 1959, p. 423-475.; ROSENBERG, M. J., HOVLAND, C. I.: Cognitive, Affective, and Behavioral Components of Attitudes. In ROSENBERG M. et al. (eds.): *Attitude Organization and Change*. New Haven, CT : Yale University Press, 1960, p. 1-14.

RP2: What are the attitudes towards the options of higher education in the field of digital gaming and game design in potential university students (respectively, the students of the last three years of high school and grammar school studies) in Slovakia?

RP2.1: Are the attitudes consistent in all their aspects? (As in, are there no significant differences between the investigated aspects of an attitude – actional, emotional and informational?)

RP3: Is there a significant positive correlation between the attitude towards playing digital games and the attitude towards potentially studying a related field in students of the last three years of high schools in Slovakia?

2.2 Research Sample, Strategy and Methods

The basic sample (population) for our research, in regard to the formulated research problems, were students of high school study programs with a secondary school leaving examination (respectively, the students of the last three years of high school and grammar school studies – usually aged 17, 18 and 19 years old) in Slovakia. Size of the basic sample of was set based on available data, as presented in the Table 1.

	17 years old	18 years old	19 years old	summary
number	51602	49794	51480	152876

TABLE 1: Number of high school students in Slovakia, structured by age

Source: own processing, 2022, according to: HALL, R. et al.: *Analýzy zistení o stave školstva: To dá rozum*. Bratislava : MESA10, 2020, p. 1120. [online]. [2022-10-01]. Available at: <<https://analyza.todarozum.sk/analyza-zisteni-o-stave-skolstva-na-slovensku.pdf>>.

Calculation of the necessary selected sample was based on the level of reliability set to 95%, with the reliability interval of 5. The calculated sample size for the set parameters equals $N=383$. Respondents for the selected sample were recruited via a commercial panel of respondents with a condition to make the sample representative, with regard to the population, age, type of study, diversity of both sexes and their residence (by regions). Between authors, there has been no real consensus about size of selected sample, with discussions primarily regarding the criteria with which these decisions must be made. Some (see P. Mareš et al.,¹⁴ J. E. Bartlett et al.¹⁵) insist that besides the sample size, the type of data (for example different approaches towards sample setting, for which sometimes nominal variable should be set, and sometimes interval variables should be set). N. Radley¹⁶ proposes that the sample size should be attributed to the type of research. Larger sample sizes are not necessarily a guarantee for higher quality of data. The classicist author G. Gallup¹⁷ points out that a well-selected sample of smaller size is preferable to an inadequately-selected sample size of larger size. Regarding the fact that not even the commercial companies focused on recruitment of respondents were not able to provide the required research size of respondents, we had to proceed with a limited number of respondents. The utilized sized, however, did fulfill the criteria for representativeness.

Altogether, 76 respondents took part in our research. The average age was 18 years (220 months) and 00 months (standard deviation = 7.28). The oldest respondent was 19.66 years old, the youngest was 17.08 years old. 52.6% of our respondents were female, 47.4% were

¹⁴ See: MAREŠ, P., RABUŠIČ, L., SOUKUP, P.: *Analýza sociálněvědních dat (nejen) v SPSS*. Brno : MUNI Press, 2015.

¹⁵ See: BARTLETT, J. E., KOTRLIK, J. W., HIGGINS, J. C.: Organizational Research: Determining Organizational Research: Determining Appropriate Sample Size in Survey Research Appropriate Sample Size in Survey Research. In *Information Technology, Learning, and Performance Journal*, 2001, Vol. 19, No. 1, p. 43-50.

¹⁶ See: BRADLEY, N.: *Marketing Research. Tools and Techniques*. Oxford : Oxford University Press, 2013.

¹⁷ See: GALLUP, G.: *Průvodce po výzkumu veřejného mínění*. Prague : Orbis, 1948.

male, which respects the representation of sexes in population. All of the respondents were high school students studying programs with a secondary school leaving examination, or just very recently passed their secondary school leaving exam. All regions of Slovakia were sufficiently represented. From the points of time invested in digital gaming, it is notable that the sample was heterogeneous with the average time spent playing digital games set at 92.17 minutes, median 60 minutes (standard deviation=113,91) and while it is not a normal dataset for population (value of the K-S test statistic (D) is .20767 and the p -value is .00236), we tend to believe that the data acquired by our survey could be used as an orientational guide for creation of an image of variables set in the formulated research problems. 72.4% of our respondents noted that they play digital games at some frequency (from occasional playing through regular playing to spending most of the free time by playing).

An online combination survey was utilized in our research, with aspects of scaling survey. Distribution and collection were completed electronically. The survey is a part of a wider research project, and therefore included 23 items divided into two groups: items focused on the topics of the research problems, and items focused on the sample's data. Not all items are subjects of this study. The items varied, some were open-ended and some were closed-ended, the latter were scaled by verbal specification on a 7-points scale (in some cases a 5-points scale, depending on the item's nature), with the option to choose a neutral answer. The demographic data was accessed by items with optional answers (region of residence, sex, age) or by open-ended items in the survey (school of study).

Data analysis was realized through statistical approaches of descriptive and inductive statistics, using the Microsoft Excel software and the SPSS software. The attitude scaling and scaling items were addressed in unison with other authors¹⁸ as interval variables, while we are aware that some authors¹⁹ propose that scaled data should be processed as ordinal data.

3 Results

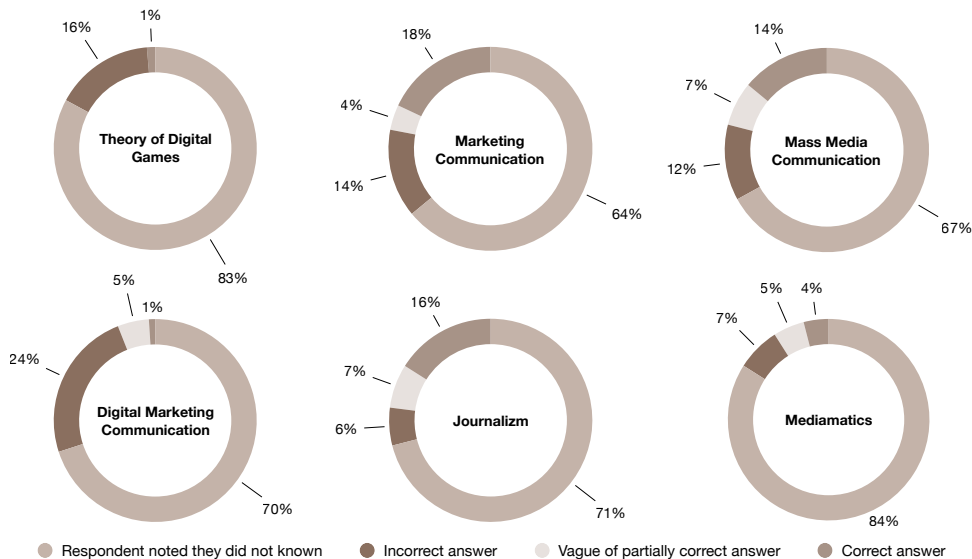
3.1 The Level of Awareness of Higher Education Options in the Field of Digital Gaming in Slovakia

The first research problem (RP1) was focused on the level of awareness about options of acquiring of qualification in the frame of higher education in the field of digital gaming and gaming design in potential future university students – the students of the last three years of high school studies in Slovakia. Of all the respondents, 47.37% wish to study (any study program) in Slovakia, while 25% would like to study abroad. A relatively sizable part of the respondents still did not have a plan after their secondary school leaving exam (10.5%). 2.6% respondents chose a different answer – enterprise, dual study etc. 14.5% of the respondents planned on getting employed after their secondary school leaving exam. Only minimum of respondents (1.32%) knew, which universities offer study programs focused on digital games. The rest answered they did not know or answered incorrectly.

¹⁸ For more information, see: KERLINGER, F. N. *Základy výzkumu chování*. Prague : Akademia, 1972.; LEONG, F. T. L., AUSTIN, J. T.: *The Psychology Research Handbook: A Guide for Graduate Students and Research Assistants*. Thousand Oaks, CA, London, New Delhi : Sage, 2006.; KAČÁNIOVÁ, M.: *Implicit Association Test and its Application in Research of Consumer Preferences*. In *Dot.comm*, 2017, Vol. 5, No. 1-2, p. 7-13.; WOJCIECHOWSKI, Ł.: *Ambientná reklama a jej percepcia generáciou Y*. [Habilitation Thesis]. Trnava : FMK UCM, 2019.; MIKULÁŠ, P., WOJCIECHOWSKI, Ł.: *Celebrity Necromarketing: Nonliving Celebrities in Media Communication*. In *Marketing Identity: Digital Life – part I*. Trnava : FMK UCM, 2015, p. 192-207.

¹⁹ See: GRAVETTER, F. J., WALLNAU, L. B.: *Essentials of Statistics for Behavioral Science*. Belmont, CA : Wadsworth, Cengage Learning, 2008.; MCBURNEY, D. H., WHITE, T. L.: *Research Methods*. Belmont, CA : Wadsworth, Cengage Learning, 2010.

These figures are shown on the Graph 1. The numbers of respondents who knew, where it is possible to study the field of digital gaming theory, and who did not know or chose an incorrect answer, are significantly different (The Chi² value is 114.38. The *p*-value is < .00001. The result is significant at *p* < .001). The most frequently presented incorrect answer was the University of Žilina (the respondents did not choose from a selection of options, the item of the survey was open-ended).



GRAPH 1: Distribution of answers of the research sample on the item regarding information about options, where it is possible to study the theory of digital gaming and other programs from the field of media and communication studies in Slovakia

Source: own processing, 2022.

Most of the respondents also perceive their own information about the university study program of the theory of digital gaming as insufficient, as is shown in the Table 2.

The range of information about the theory of digital gaming field by a respondent:		Self-evaluation of the respondents– how much information do they have about the theory of digital gaming study program		Assumption that the respondent will look up more information about the study program of theory of digital gaming.	
Absolutely insufficient (1)	35.5%	Much less than the others (1)	42.1%	Definitely wrong (1)	23.7%
Insufficient (2)	15.8%	Less than the others (2)	9.2%	Wrong (2)	19.7%
Rather insufficient (3)	15.8%	Probably less than the others (3)	22.4%	Probably wrong (3)	13.2%
Nor sufficient, neither insufficient (4)	18.4%	As much as the others (4)	18.4%	Nor wrong, neither correct (4)	21.1%
Rather sufficient (5)	9.2%	Probably more than the others (5)	3.9%	Probably correct (5)	10.5%
Sufficient (6)	0.0%	More than the others (6)	1.3%	Correct (6)	5.3%
Absolutely sufficient (7)	5.3%	Much more than the others (7)	2.6%	Definitely correct (7)	6.6%
Total	100.0%	Total	100.0%		100.0%

TABLE 2: Information about the university study program of the digital gaming theory in the research sample – the students of the last three years of high school studies with a secondary school leaving exam in Slovakia

Source: own processing, 2022.

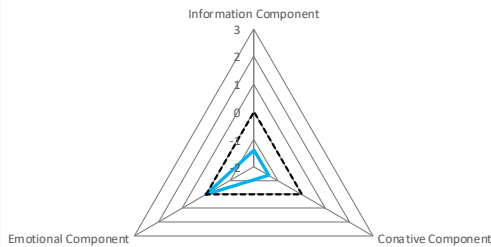
As opposed to this data, the level of awareness about related study programs in the field of media and communication studies in the target group is higher, with exceptions of mediamatics and digital marketing communication, in which only minimum of respondents were able to localize the programs correctly (1.32% for digital marketing communication and 3.95% for mediamatics). Especially notable level of awareness was present for marketing communication, mass-media communication and journalism. For example, 18.42% of the respondents were able to correctly answer where is it possible to study marketing communication (this figure was at only 1.32% for digital gaming), while 64.47% mentioned they did not know (this figure was at 82.89% for digital gaming), and finally 14.47% of the respondents answered incorrectly, while 3.95% answered partially correctly (for example including multiple answers with some correct ones among them). Institutions of higher education offering the mass-media communication study program were correctly named by 14.47% of the respondents, incorrectly named by 11.84% respondents and partially correctly by 6.58% of the respondents, while 67.11% answered they did not know, which institutions offer this study program. The differences in the data about identification of study options for the investigated study programs at the concrete colleges and universities were statistically significant (absolute values calculated) (The χ^2 value is 52.025. The p -value is $< .0000056$. The result is significant at $p < .001$; with regard to some of the lower counts we chose to implement the Yates' correction, and the results are: Yates' chi-square 42.803, Yates' p -value is 0.00016893. The result is significant at $p < .001$).

To answer the RP1 we are therefore able to generalize, that the level of awareness about the options of acquiring qualification in the frame of higher education in the field digital gaming in potential future university students (the students of the last three years of high school and grammar school studies) in Slovakia is rather low, while the level of awareness about the study programs in the field of media and communication studies is significantly different, hugely disadvantaging digital gaming and mediamatics, but not significantly different from the level of awareness about other study programs from various fields.

3.2 Attitudes of Youth in Slovakia Towards Possibilities of Acquiring Higher Education in the Field of Digital Gaming

The identified attitudes towards possibilities of acquiring higher education in the field of digital gaming in potential future university students (the students of the last three years of high school and grammar school studies) showed, that these attitudes tend to have neutral to negative valency (RP2.1) while also showing a slight inconsistency. Specific data is included in the Table 3.

Information aspect	AM*	sd	
	2,59	1,43	
	Actional aspect	2,62	1,47
Emotional aspect	4,01	1,48	
	T value	P value	
Actional vs. emotional	6.209416	3,52762E-08 *** Bonfer. Cor. 0.000***	
Actional vs. informational	0.42487	0,911269 n.s. Bonfer. Cor. 0.000***	
Informational vs. emotional	6.204536	1,36085E-08 *** Bonfer. Cor. 0.000***	
correlation	Infor-mational	actional	emotional
Perceived benefit: R/p	0.1358 p 0.242 n.s. Bonfer. Cor. 0.000***	0.2391 p 0.037 * Bonfer. Cor. 0.000***	0.4138 p 0.002 *** Bonfer. Cor. 0.000***



Legend: - - - = center, blue = resulting profile

Note: data was transposed to the scale of 1-7 for the purposes of the research
 Legend: *** = The value of p is < .001, * = The value of p is < .05, significant, n.p. = not significant, Bonfer. Cor. = Bonferroni correction

TABLE 3: Aspects of attitudes and significance of differences between the attitude aspects towards the theory of digital gaming study program in the research sample – the students of the last three years of high school and grammar school studies in Slovakia

Source: own processing, 2022.

While the emotional aspect oscillates around the neutral position with a slightly positive tendency, the actional and informational aspects are saturated minimally – the respondents did not have information and declared low activity in the attitude. The aforementioned differences are also highly statistically significant (RP2.2). Furthermore, it was identified that a minority of the respondents see the theory of digital gaming study program as socially beneficial (26.95%), while 40.79% perceive it as non-beneficial, and 30.3% did not take a stand on this topic. This data is cumulated from a 7-point scale and the results were also confronted with the discovered aspects of the attitudes (Picture 1 – below). The results confirmed that perceived social benefit of the study program correlates with the researched aspects of the attitudes. With a well-aimed campaign, it should be possible to increase positive emotional response and attitude, while also increasing the actional and informational saturation of the attitudes towards the study program, after which we could expect an increase in the perceived social benefit of the study program. The campaign mechanisms themselves, however, could not be identified solely with the data from this research.

3.3 Correlation Between Playing Digital Games and Intentions Towards University Study of the Digital Gaming Studies Study Program

We present the basic information for the RP3 in the Table 4 and Table 5. This data shows, that the respondents of the research sample comprise a relatively heterogenous sample in the relationship to playing digital gaming, but the intensity was mostly leaning towards occasional playing, sometimes regular playing, for entertainment purposes. Strong gamers, who spent most of their free time by playing video games, were represented by 7.9% of the respondents. Professional gamers were not in the research sample (0%). Similar results are connected to

the experienced Flow – value 2.51 suggests rather limited experience with the aforementioned phenomenon in the research sample (52.72% of the respondents have not engaged with the game to an extent, in which they would stop paying attention to their surroundings). A relatively high level of the standard deviation (sd=2.26), however, suggests, that there are respondents in the research sample (32%) who had noted the phenomenon, and 9.1% of them even agrees with the said statement totally.

	Self-evaluation in digital gaming		Chosen aspects of the attitudes towards the theory of digital gaming study program			
	Playing digital games ^I	the Flow experience while gaming ^{II}	Interest in the digital gaming study program ^{III}	Suitability of the study program for the respondent ^{IV}	Prediction-anticipation of pleasantness/unpleasantness of the program ^V	Probability of choosing the study program ^{VI}
AM	1.11	2.51	2.82	2.45	4.01	2.07
sd	0.90	2.26	2.01	1.92	1.48	1.53

Legend – see the footnotes²⁰

TABLE 4: Average score and standard deviations in the investigated variables in the research sample – the students of the last three years of high school and grammar school studies in Slovakia

Source: own processing, 2022.

The digital gaming theory study program appeals to youth relatively similarly to other study programs, while during the interpretation of this data it is necessary to take into account the extensive list of various offered study programs from various fields (currently, there are 48 fields included in the guideline of the Slovak Ministry of Education, Science, Research and Sport).²¹ It also important to note the not entirely sufficient size of the research sample (N=76), which would theoretically appropriate about 1.5 respondent for every single study program, if these

²⁰ I The score displays the measure of intensity scaling from 0 to 4, while the 0 marks the respondents who do not play digital games, and the 1 marks the respondents who play digital games occasionally. The final value is 4, which would mark the professional gamer. Respondents were also presented with the option to choose 'other', but none have chosen this option.

II The Flow experience marks such a measure of engagement while playing a digital game, that the player stops paying attention to their surroundings. The 0 marks the respondents who do not play digital games, the 1 marks the respondents who report the Flow experience is not a precise description for their experiences, while 2 is not correct, 3 less than correct, 4 nor correct, neither incorrect, 5 somehow correct, 6 correct, 7 absolutely correct.

III The respondents answered how interesting is the digital gaming theory study program for them – the score was attributed in accordance with the 1-7 scale, in which the 1 marks the respondent for whom the study program is absolutely uninteresting, while the 7 marks the respondent for whom the study program is absolutely interesting. The respondents who did not know of the program were attributed with the score 0.

IV The respondent answered how suitable is the digital gaming theory study program for them – the score was attributed in accordance with the 1-7 scale, in which the 1 marks the respondent for whom the study program is absolutely unsuitable, while the 7 marks the respondent for whom the study program is absolutely suitable. The respondents who did not know of the program were attributed with the score 0.

V The respondents presented their anticipated measure of pleasantness, respectively unpleasantness of the study program on the 1-7 scale, in which the 1 marks the respondent for whom the study programs seem absolutely unpleasant, while the 7 marks the respondent for whom the study program seems absolutely pleasant. The respondents who did not know of the program were attributed with the score 0.

VI The respondents answered an item about the probability of them choosing the digital gaming study program for their university study, and received score on the 1-7 scale, in which the 1 marks the respondent with an extremely low probability to choose the program, while the 7 marks the respondent with an extreme probability to choose the program.

²¹ *Študijné odbory, v ktorých môžu vysoké školy v Slovenskej republike poskytovať vysokoškolské vzdelávanie.* [online]. [2022-10-01]. Available at: <https://www.slov-lex.sk/pravne-predpisy/prilohy/SK/ZZ/2019/244/20190901_5173916-2.pdf>.

respondents were to be divided accordingly. Taking this division into consideration, the fact that 2.6% respondents noted that the digital gaming field is absolutely interesting for them. The average measured value is 2.82, but the high standard deviation value also points at some of the youth with a high measure of declared interest.

This data also suggests, that the respondents consider the study program as potentially pleasant to study (40.8% vs. 28.0% of those, who see it as potentially unpleasant to study). 30.3% of the respondents took a neutral position on the scale. The correlation coefficients are also included in the Table 4.

Chosen aspects of the attitudes towards the theory of digital gaming study program				
	interest in the digital gaming study program	suitability of the student program for the respondent	Prediction – anticipation of pleasantness / unpleasantness of the study program	probability to choose the study program
playing digital games	R = 0.3338 P-Value = 0.003211 ** Bonf. Cor. 0.00040	R = 0.2799 P-Value= 0.014332 * Bonf. Cor. 0.00179	R = 0.3474 P-Value = 0.002107 ** Bonf. Cor. 0.00026	R = 0.3142 P-Value = 0.005708 ** Bonf. Cor. 0.00071
the Flow experience	R = 0.1795 P-Value = 0.120772 n.s. Bonf. Cor. 0.01510	R = 0.3242 P-Value = 0.004276 ** Bonf. Cor. 0.00053	R = 0.2486 P-Value = 0.030354 * Bonf. Cor. 0.00379	R = 0.2878 P-Value = 0.011703 * Bonf. Cor. 0.00146

Note: Statistically significant correlation even before corrections are marked with bold, * = The value of $p < .05$; ** = The value of $p < .01$; The value of n.s. = not significant, Bonf. Cor. = Bonferroni correction

TABLE 5: Identified levels of correlation between playing digital games and shown aspects of attitudes towards potential study of the theory of digital gaming study program in the research sample - the students of the last three years of high school and grammar school studies in Slovakia

Source: own processing, 2022.

Since we completed repeated confrontation of the data via the correlation coefficient, the final values of significance were finally submitted to the Bonferroni's correction (Table 4, marked as 'Bonf. Cor.'). The data confirmed that the interest in digital gaming as a hobby significantly correlates to the interest of studying the field of the theory of digital gaming study program, which these respondents could choose for their university study. Similarly, those who play digital games perceive their probability to choose this field as higher. For the RP3 we can therefore conclude that there is a significant positive correlation between playing digital games and the declared attitudes towards the potential study of such a field in the students of the last three years of high school study in Slovakia. It is, however, necessary to submit these finding to further similar analysis in the future, as these identified correlations do not have to necessarily stem from a causality between the investigated variables.

4 Discussion and Limits

The presented data and results need to be perceived as indicators, as the research sample used in this study was relatively small (N=76). Further limits of this study stem from the chosen method of an online survey, for which more variables not originally noted in the study, might be important (motivation of the respondents, their interests and hobbies, personal characteristics, types of factors they would consider when choosing a study field, family context connected to higher education et cetera). These results also reflect on the image of colleges, universities and faculties as well as on the situational variables, such as the current presentation of some of these institutions in connection with other topics.

Despite the aforementioned limits, it is possible to conclude that the information gathered in the study bring specific indicator not only for further research, but also for the interested subject. The question of insufficient information about university studies, respectively the fact that high school students do not have access to this information, which our study suggests, was probably one of the main reasons why the Slovak Ministry of Education, Science, Research and Sport supported a study by the Armstrong Company.²² Among other information, this material brings insight and manuals. After extensive research, the study also pointed out that 54% of university absolvents would today make a different decision about their university education, of which 36% would choose a different university and 41% a different study program. In the material, the authors make a note that satisfaction with studying is closely connected to the prospects of future employment after completion of the study program. The correlation between satisfaction with the study program and access to sufficient information about it were further affirmed in a study by M. Bílik.²³

The digital gaming field is currently evolving rather dynamically, as is proven by the fact that in a relatively short time, various subjects and study programs connected to the field have been emerging, and not only in the context of colleges and universities, but also in the context of high school studies – which is generally a context of the last two years. Comparatively, in the Czech Republic and Poland, in which Slovak students are able to study without significant language barriers, the situation in the field of digital gaming with a calculation to the population size seems very similar.²⁴ Even further, this emergence of new study programs focused on the field even at high schools also proves the growing interest in the field, opening new perspectives for preparation of future candidates for future university studies.

Our findings correspond with the earlier research submitted by the aforementioned Armstrong company, which noted that the main benefit of higher education is perceived by the youth as a way for their own personal development.

5 Conclusion

Establishing game studies in academia as a part of humanities has overcome a difficult journey since 2001. Nowadays, a study in this field is much more accessible even in countries where the development of the overall game sector has been slowed down due to geopolitical conditions, like Slovakia. The issue is that young people in those countries interested in working in the gaming sector in the future often do not even know about existing opportunities to study digital games also within higher education.

Results of the research show, that:

- a huge majority of students of the last three years of high school and grammar school studies with a secondary school leaving examination does not know where it is possible in our conditions to study a study program focused on digital gaming; these results are confirmed by a statistical significance;
- majority of respondents testify that the range of information they have about the study program focused in digital gaming is insufficient; and majority of respondents tends to believe that they themselves are less informed than their peers; most of them, however, will probably not look for more information about the topic;

²² *Fakty a údaje pre uchádzačov o vysokoškolské štúdium. Materiál o zdrojoch informácií a ich vhodnom použití v rámci rozhodovania o vysokoškolskom štúdiu.* [online]. [2022-10-01]. Available at: <https://www.minedu.sk/data/files/6545_fakty-a-udaje-pre-uchadzacov-o-vysokosk-studium.pdf>.

²³ BÍLIK, M.: *Výsledky prieskumu – Dopad COVID-19 na študentov.* Released on 23rd July 2020. [online]. [2022-10-01]. Available at: <<https://srvs.eu/2020/07/23/vysledky-prieskumu-dopad-covid-19-na-studentov/>>.

²⁴ See: *Kształcenie dla Branży Gier.* [online]. [2022-07-30]. Available at: <<https://polskigamedev.pl/ksztalcenie-dla-branzy-gier/>>; BOJNANSKÁ, K.: *Kde v Česku studovat počítačové hry? (AKTUALIZOVÁNO 2021).* Released on 15th March 2021. [online]. [2022-07-30]. Available at: <<https://visiongame.cz/kde-v-cesku-studovat-pocitacove-hry/>>.

- attitudes of respondents regarding higher education in the digital gaming field show a slight inconsistency between the emotional, actional and informational aspects;
- the results were identified in a selected research sample consisting of youth, while we discovered a significant positive correlation between playing digital games and declaring positive attitudes towards the study program by students of the last three years of high school and grammar school studies with a secondary school leaving examination, implying that with growing frequency and intensity of playing digital games, the interest in studying a study program in such a field also tends to be higher, deeming it more interesting, potentially pleasant and generally suitable; the positive intention itself, however, must be approached with a certain level of skepticism, as these respondents had originally declared different intentions in the introductory part of the survey, implying that the survey itself might have risen the respondents' awareness of the field and study programs, possibly positively increasing saturation of the actional and informational aspects of the respondents' attitudes towards the study program;
- the frequency of playing digital games moderates several areas of attitudes towards the study program, as opposed to the Flow experience, which seems to be of very little significance when it comes to perceiving the study program as interesting.

Based on the results, we recommend:

- to increase the intensity of information campaigns about the possibilities of studying the field of digital gaming, respectively the theory of digital gaming study program, at high schools with secondary leaving exam, underlining the specific steps required for commencing the study – the topics of submitting applications, realization of the study, effects of the study and prospects of future employment for absolvents (which could support the informational and actional aspects of the attitudes);²⁵
- to also use the campaigns to improve the general image of the study program, underlining its importance for the society and other positive advantages of the field, in order to saturate context for improvement of the emotional and informational aspects of the attitudes;
- to intentionally target gamers and to recruit future students especially from the pool of young people who actively play digital games in their free time.

While the presented study presents points about various mediators of attitudes towards the university study in the field of digital gaming, it does not reflect on the structures of motivation and on the measure of conversion for the identified intentions by the youth. These phenomena will be included in future research activities of the authors, as well as other set variables, which could potentially intervene in current and future findings. We positively perceive the confirmation, that there is a correlation between interest in a field and the prospect of future employment in the youth, as this would make their path to self-development and self-realization easier. These phenomena, however, pass the boundaries of our field and point at the need to move this topic into an interdisciplinary context, in order to fulfill the ambition of addressing the topic in a more complex fashion.

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²⁵ Media literacy related to digital games is analysed, e.g., by L. Škripcová. See: ŠKRIPCOVÁ, L.: Media Literacy in Digital Games. In *Media Literacy and Academic Research*, 2022, Vol. 5, No. 1, p. 132-138. [online]. [2022-12-13]. Available at: <https://www.mlar.sk/wp-content/uploads/2022/05/7_Lucia-Skripcova.pdf>.

Literature and Sources:

- AARSETH, E.: Meta-Game Studies. In *Game Studies*, 2015, Vol. 15, No. 1. ISSN 1604-7982. [online]. [2022-07-22]. Available at: <<http://gamestudies.org/1501/articles/editorial>>.
- AARSETH, E.: Computer Game Studies, Year One. In *Game Studies*, 2001, Vol. 1, No. 1. ISSN 1604-7982. [online]. [2022-07-23]. Available at: <<http://gamestudies.org/0101/editorial.html>>.
- AARSETH, E.: *Cybertext: Perspectives on Ergodic Literature*. Baltimore, MD : The Johns Hopkins University Press, 1997.
- Ako na Slovensku študovať tvorbu videohier? Tu nájdete odpoveď. [online]. [2022-07-25]. Available at: <<https://sgda.sk/education/>>.
- BARTLETT, J. E., KOTRLIK, J. W., HIGGINS, J. C.: Organizational Research: Determining Organizational Research: Determining Appropriate Sample Size in Survey Research Appropriate Sample Size in Survey Research. In *Information Technology, Learning, and Performance Journal*, 2001, Vol. 19, No. 1, p. 43-50. ISSN 1535-1556.
- BÍLIK, M.: *Výsledky prieskumu – Dopad COVID-19 na študentov*. Released on 23rd July 2020. [online]. [2022-10-01]. Available at: <<https://srvs.eu/2020/07/23/vysledky-prieskumu-dopad-covid-19-na-studentov/>>.
- BOJNANSKÁ, K.: *Kde v Česku studovat počítačové hry? (AKTUALIZOVÁNO 2021)*. Released on 15th March 2021. [online]. [2022-07-30]. Available at: <<https://visiongame.cz/kde-v-cesku-studovat-pocitacove-hry/>>.
- Fakty a údaje pre uchádzačov o vysokoškolské štúdium. Materiál o zdrojoch informácií a ich vhodnom použití v rámci rozhodovania o vysokoškolskom štúdiu. [online]. [2022-10-01]. Available at: <https://www.minedu.sk/data/files/6545_fakty-a-udaje-pre-uchadzacov-o-vysokosk-studium.pdf>.
- FRASCA, G.: Simulation versus Narrative: Introduction to Ludology. In WOLF, M. J. P., BERNARD, P. (eds.): *The Video Game Theory Reader*. London, New York, NY : Routledge, 2003, p. 222-225.
- GALLUP, G.: *Průvodce po výzkumu veřejného mínění*. Prague : Orbis, 1948.
- GÁLIKOVÁ TOLNAIOVÁ, S.: On Perspectives of Teacher Training and Understanding of Their Digital Competencies as Determinants of Digital Education. In *Media Literacy and Academic Research*, 2021, Vol. 4, No. 1, p. 118-133. ISSN 2585-9188.
- GRAVETTER, F. J., WALLNAU, L. B.: *Essentials of Statistics for the Behavioral Science*. Belmont, CA : Wadsworth, Cengage Learning, 2008.
- HAPALOVÁ, M., HALL, R.: *Analýzy zistení o stave školstva. Demografické východiská úvah o stave školstva* (Tabuľa T_P1.11). Bratislava : MESA10, 2020, [online]. [Date of access, 2022-10-01]. Available at: <<https://analyza.todarozum.sk/docs/19061818140001xfj1/>>.
- KABÁT, M. et al.: Pen & Paper & Xerox: Early History of Tabletop RPGs in Czechoslovakia. In *Acta Ludologica*, 2022, Vol. 5, No. 1, p. 102-117. ISSN 2585-8599.
- KAČÁNIOVÁ, M.: Implicit Association Test and its Application in Research of Consumer Preferences. In *Dot.comm*, 2017, Vol. 5, No. 1-2, p. 7-13. ISSN 1339-5181.
- KATZ, D., STOTLAND, E.: A Preliminary Statement to a Theory of Attitude Structure and Change. In KOCH, S. (ed.): *Psychology: A Study of a Science: Vol. 3 Formulations of the Person and the Social Context*. New York, NY, Toronto, London : McGraw-Hill, 1959, p. 423-475.
- KERLINGER, F. N.: *Základy výzkumu chování*. Prague : Akademia, 1972.
- Kształcenie dla Branży Gier. [online]. [2022-07-30]. Available at: <<https://polskigamedev.pl/ksztalcenie-dla-branzy-gier/>>.
- LEONG, F. T. L., AUSTIN, J. T.: *The Psychology Research Handbook: A Guide for Graduate Students and Research Assistants*. Thousand Oaks, CA, London, New Delhi : Sage, 2006.
- MAGO, Z.: *Úvod do štúdia digitálnych hier I*. Trnava : FMK UCM, 2020.
- MÄYRÄ, F.: *An Introduction to Game Studies: Games in Culture*. London : SAGE Publications, 2008.

- McBURNEY, D. H., WHITE, T. L.: *Research Methods*. Belmont, CA : Wadsworth, Cengage Learning, 2010.
- MIKULÁŠ, P., WOJCIECHOWSKI, Ł.: Celebrity Necromarketing: Nonliving Celebrities in Media Communication. In *Marketing Identity: Digital Life – part I*. Trnava : FMK UCM, 2015, p. 192-207.
- ROSENBERG, M. J., HOVLAND, C. I.: Cognitive, Affective, and Behavioral Components of Attitudes. In ROSENBERG, M. et al. (eds.): *Attitude Organization and Change*. New Haven, CT : Yale University Press, 1960, p. 1-14.
- RUSSELL, S.: *Spacewar!*. [digital game]. Cambridge, MA : S. Russell, 1962.
- RYAN, M.-L.: Beyond Myth and Metaphor – The Case of Narrative in Digital Media. In *Game Studies*, 2001, Vol. 1, No. 1. ISSN 1604-7982. [online]. [2022-07-22]. Available at: <<http://gamestudies.org/0101/ryan/>>.
- SMITH, M. B.: The Personal Setting of Public Opinions: A Study of Attitudes Toward Russia. In *Public Opinion Quarterly*, 1947, Vol. 11, No. 4, p. 507-523. ISSN 0033-362X.
- ŠKRIPCOVÁ, L.: Media Literacy in Digital Games. In *Media Literacy and Academic Research*, 2022, Vol. 5, No. 1, p. 131-140. ISSN 2585-9188. [online]. [2022-12-13]. Available at: <https://www.mlar.sk/wp-content/uploads/2022/05/7_Lucia-Skripcova.pdf>.
- Študijné odbory, v ktorých môžu vysoké školy v Slovenskej republike poskytovať vysokoškolské vzdelávanie. [online]. [2022-10-01]. Available at: <https://www.slov-lex.sk/pravne-predpisy/prilohy/SK/ZZ/2019/244/20190901_5173916-2.pdf>.
- ŠVELCH, J.: *Gaming the Iron Curtain: How Teenagers and Amateurs in Communist Czechoslovakia Claimed the Medium of Computer Games*. Cambridge, MA : MIT Press, 2018.
- WIJMAN, T.: *The Games Market Will Show Strong Resilience in 2022, Growing by 2.1% to Reach \$196.8 Billion*. [online]. [2022-07-22]. Available at: <<https://newzoo.com/insights/articles/the-games-market-will-show-strong-resilience-in-2022>>.
- WOJCIECHOWSKI, Ł.: *Ambientná reklama a jej percepcia generáciou Y*. [Habilitation Thesis]. Trnava : FMK UCM, 2019, 141 p.

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