

Intellectual games concept review in THE XIX – XXI century (Google book Ngram Corpus scientific materials base)

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Abstract. In the context of the development of information technology in the world, modern scientists have noted in children, youth and adults the processes of creative and intellectual degradation, the growth of functional illiteracy. In the 20th century, the value of general intelligence for each new generation was one more statistical “norm” than the previous one. Scientists have discovered that the activity of a man of the 21st century in his free time becomes more significant for the development of his intellect and creativity (gaining a state of “flow”) than activity during working hours. The intellectual load during leisure time allows a person to maintain a high level of mental activity until the end of his life, to prevent brain degradation. In the scientific community, from the mid-19th century, the verbal definition of the term “intellectual games” is enclosed in different types of games. Drawing analogies between the concepts of “Quiz” and “intellectual games”, the authors of the article determine that they are the product of two opposites: mass, entertainment culture and intellectual culture, which is characteristic of a rational person, capable of endless development. The authors described a modern tool for working in the database of scientific materials Google Book Ngram Corpus. This database contains also materials concerning architecture, construction, machine-building fields of research. With its help, connotations of intellectual games in the history of their development were considered.

1 Introduction

In any microdistrict of a large Russian city we can see signboards of various companies which offer services on developing games for children in their first years of life and preparing school games for children in a playful way, as well as games for intellectual development for schoolchildren, and preschoolers. For young people and adults game rooms are offered, both for board games and for intellectual quests. And every university in the city has its own students’ teams for intellectual competitions.

KVN-type TV shows are collected over multimillion viewers, as well as “What? Where? When?” game (“WWW”) is held not only as a show, but also in the form of

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international sports as a type of intellectual marathons. What caused such popularity and the demand for such game forms?

The answer to this question can be described through scientists' statement about children, youth and adult processes of creative [1,2] and intellectual [3-6] degradation, as well as the proliferation of such a phenomenon as "functional illiteracy" [7, 8]. The phenomenon of "functional illiteracy" is increasingly observed not only among those who can write and read, but also among those who have higher education and even receive a scientific degree. At the same time, it is noted that in the 20th century the value of general intelligence (assessment of convergent thinking) for each new generation was one more statistical "norm" than the previous one [9]. Vladimir Mikhailovich Bekhterev is credited with the authorship of the statement that only 1/5 of the people were given "the great happiness to die, preserving the mind on the roads of life".

A well-known researcher of such a phenomenon as "happiness", Mihai Chiksentmihayli shows that, as a rule, a person's activity in the free time is more significant for the development of intellect and creativity (gaining a state of "flow") than activity during working hours [10]. This thesis was supported at different times by other authors. For example, philosophers of the 19th century believed that the self-development of citizens in their free time would be the wealth of the whole society (K. Marx, Capital), and "the free development of each person is a condition for the free development of all people" (K. Marx, "Manifesto of the Communist Party"). Modern researchers believe that the nature of human activity during their leisure hours determines what will happen to the associative fields of the cerebral cortex, brain degradation or its development [11]. One of the "WWW"-game participants, B. R. Mandel, quotes from the diary of K. E. Tsiolkovsky about the development of person abilities: "... first he discovered the truths known to many, then he began to discover the truths known to some, and finally began to discover the truths, not yet known to anyone "[12]. This author summarizes a number of studies from different years and countries (Japan, USA, Israel) that show that subjects, engaged in mental work (to which the author relates intellectual games), allow to have such a clear mind, even in old age, as they had in their youth [12].

Thus, the intellectual training-load during leisure time (for example, in the intellectual games process, scientific activities or learning foreign languages) allows people to maintain a high level of mental activity until the end of life as well as helps to prevent brain degradation. With such intellectual pursuits, a person can enter a state of "flow", which was described by M. Chiksentmihayli and compared with feelings of "happiness". All this can explain to us the demand for intellectual games in modern society.

2 Discussions

To answer the question "what is meant by "intellectual games?" in the search line of a scientific electronic library [elibrary.ru], it is necessary to formulate a request for works with the names, annotations, keywords or in the text of which the term "intellectual games" appears (taking into account morphology). For a number of organizational reasons, we will consider only the period after 2009 to be more or less "full" years that can give an adequate idea of scientific activity in general. Thus, over the past 10 years (from 2009 inclusive) at the time of the appeal (11/27/2019), 947 scientific papers were obtained (for the annual dynamics of the researches number, see Table 2 from Section 2.1), showing a steady upward trend in the works referring to this topic. Trying to fluently group the works from this sample, it can be seen that in the scientific community there are discussing (studying) issues that are related (according to the authors) to intellectual games, given in random order:

- games (at school and universities) to prepare for exams (all types of the State Academic Examinations), in the classes of literature, physics, chemistry, geography, astronomy, mathematics, biology, economics, Russian and foreign languages, management, marketing, music, law, ecology and so on (including Olympiads of various levels);
- game training for preschoolers and games for children of the first years of life;
- the impact of chess, billiards and similar games on different age categories of people (including when they have different sports skills);
- specialized intellectual games for the formation and development of professional skills of specialists in education, public service, transport, management and industries;
- games for the communication skills development, including the contingent with a weak level of socialization caused by various reasons;
- intellectual games in terms of intellectual and creative abilities development and thinking;
- intellectual-entertaining and organizational-activity games;
- forms of intellectual games (multimedia, theatrical, etc.);
- psycho-physiological, psychological, physiological, philosophical, pedagogical, social, methodological aspects of intellectual games;
- patent law on intellectual property which is associated with the development, preparation and commercialization of intellectual games;
- discussion of team intellectual competitions between universities or “WWW”-game participants from the point of view of experience in development, organization, conduct, results - both from the position of the organizers and from the positions of participants;
- and a number of others.

3 Materials and methods

In “E-library”, as well as in other domestic and foreign bibliometric databases, there is no possibility of conducting multi-level connotational analysis of texts (especially if the works are written in different languages) which leads to the use of other tools. Moreover, out of the 947 works mentioned above, there is no a single foreign one: there is only one work in English in which Russian authors discuss the “Debate”- game.

The choice of adequate word forms, especially in a foreign language, is a well-known problem. Therefore, a verbal definition of the “well-known” term “intellectual games” is required, examples of which could be “What?” Where? When?” (“WWW”), KVN and others. Moreover, we note that the consideration of games, conducted by Anton Semenovich Makarenko or by Georgy Petrovich Shchedrovitsky, requires a separate review and such consideration is not included in the objectives of this work.

Despite the fact that on the “WWW”-game website the English version is listed as an “intellectual game”, this does not correspond to the actual use of this bigram in English sources (the year of the first coincidence with the base of n-grams is 1807). Using the links in Google Books, which are related to the results of search queries in Google Books Ngram Viewer, we are talking only about games like “go”, chess and similar ones, or about political “games” of states. In the same way, we consider a number of other bigrams, sometimes used by domestic authors to match the concept of “intellectual games”.

“Mind game”: the bigram has been dating since 1885, it is associated with golf, the psychology of sports and (later) political processes.

“Mental game”: a bigram dating from 1820, it is associated with poker, basketball, tennis and (later) psychotherapy.

“Head game”: the bigram has been dating since 1816, it is associated with baseball, football, management and litigation.

“Game of skill”: a bigram has been dating since 1759, it is associated with skill games - such as throwing sports equipment (at a target), later found in connection with the game theory.

“Intellectual Olympiad”: the bigram does not occur; the Olympiad monogram has been dating since 1638. It is associated with sports games between the Olympic Games, as well as scientific / student / school Olympiads in narrow subject areas (physics, mathematics, etc.). The use of the Olympiad monogram practically disappears by the end of the 19th century (recall that we estimate the share of coincidence of n-grams per year with the base of all scientific literature for this year).

“Intellectual play”: the bigram meets from 1812, it reaches a peak between 1920 and 1940, being associated with developmental games for young children (from 1 year old) and educational / applied games in pedagogical practice (schoolchildren, students).

“Intellectual marathon”: the bigram first occurs in 1931 (the highest level in the history of this bigram includes law and construction, architecture, politics, pedagogical and psychological experiments). Then the use of the bigram stops until 1957. Since 1958, the bigram has been encountered regularly (linguistics, the study of children's giftedness, industrial design, economics, philosophy; also found in recommendations on scientific activities, including PhD), except for 1964-67 and 1979-82.

“Intellectual sport”: the bigram has been dating since 1832; it is associated both with the art of public speaking (in a wide variety of fields, including theology and politics), and with games such as croquet. It reaches its peak between 1900 and 1971.

“Brain ring” (reverse tracing paper from our brain-ring - “brain-racing”): the bigram has been dating since 1850 and was related only to anatomy.

“Guessing game”: the bigram has been dating since 1858 and it is related to charades and riddles. The modern range is wider: situations related to child psychotherapy, instructions for programming for creating game programs and web tools.

This list can be continued further, but this cannot lead to the desired n-gram. Let's try to use survey work for this purpose. In the review “Intellectual game: a sociocultural phenomenon in movement (toward questions of history and the definition)” [2], the author, using more than 40 sources, considers the concept of “game” from all conceivable points of view. The author showed generally accepted functions and purposes for dramatic, military, holiday, sports, business, role-playing and didactic games, noted that there is no similar certainty with respect to intellectual games. Moreover, the author adheres to the point of view (and we agree with him) that “the invention of intellectual games, as well as the ability to call them that way, is not only the most important moment in the study of human intelligence and in the likelihood of obtaining new, non-standard, non-traditional means of the development, but also leads to a number of discoveries in the study of mental, cognitive abilities and capabilities of a person, as well as the emergence of new directions in pedagogy, psychology, cultural studies, social pedagogy, etc.” [12].

As a serious impetus to understanding the intellectual games nature, which the author of the study contrasts with checkers, chess, etc., the author considers the emergence of the “WWW”-game and in this context author considers the English-language analogue “Quiz” and the author connects such events with the term “Jeopardy” as “Brain ring” and “Own game”. By drawing analogies between the concepts of “Quiz” and “intellectual games”, the author shows that this is “the product of two opposites: mass, entertaining culture and the pursuit of knowledge, which is characteristic of the indefatigable nature of a person intelligent, who wants to develop indefinitely” [12]. The author highlights another important element: a wide interest in intellectual games among young people, which is preserved among young participants at a later age. The author considers intellectual games as “the powerful means that form and improve not only intellectual development, but also

communicative skills, social, socio-psychological, personal and professional qualities of a person” [12].

In conclusion, the author offers his own definition, content and result of intellectual games: “an intellectual game is a game in which thinking and memory are fully involved, and the mental operations of player participants are aimed at identifying and understanding the material presented; a game that has convergent (search in one direction upon receipt of one single correct answer) and divergent (search in different directions) productivity with the aim of obtaining an estimated judgment about the consistency (correctness) of a given situation, the accuracy of the answer, or the solution found.

As all the above expert opinions have shown, the general structure of the intellectual game contains four main components (Figure 1):

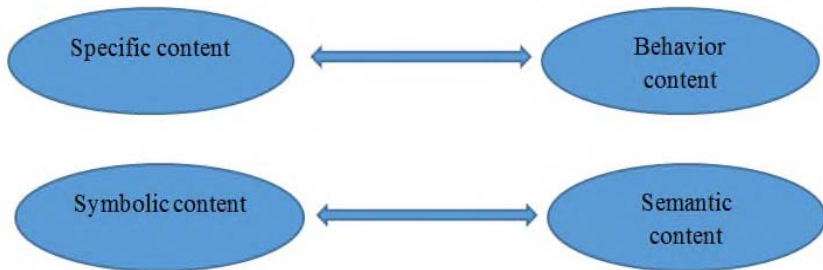


Fig. 1. The main components of an intellectual game.

So, the contents of the intellectual game are:

- specific (real objects or their image);
- symbolic (letters, signs, numbers);
- semantic (meaning of words);
- behavioral (actions of another person and himself).

The distinguished components of an intellectual game make it possible to evaluate its use for adaptation, understanding, learning and even therapy. Scientists identified eight functions of an intellectual game: imitation; playing real-life roles; reflection of the individual experience; expression of repressed needs; exit of “forbidden impulses”; appeal to roles that help expand identity; reflection of the growth, development and maturation, as well as solving different problems. The intellectual game, on the one hand, gives momentary joy, serves the satisfaction of needs.

On the other hand, the intellectual game is always directed towards the future, as it solves any life problems, fixes the abilities, skills, as well as it can perform social and professional functions.

In this case, we can talk about the formation of tolerant communicative behavior, as an important professional quality, through the intellectual game.

So, the universality of the intellectual game’s possibilities is manifested in the unity of the mental, spiritual and practice-oriented attitude to the world. In other words, the implementation of the components of an intellectual game takes place in the ability to apply value-conscious knowledge and ideas about the world, environment, personally developed beliefs and principles with the active inclusion in the realities of life and creative self-affirmation, as well as in interpersonal relationships.

Speaking about the effectiveness of the intellectual game as a separate form of training, it should be noted that, in intellectual game, another important task is realized - the team formation of like-minded people. To some extent, the task of socializing the individual is also solved in this way. The ability to concentrate collective thinking is a necessary factor for the success of any team in a business and informal communication. Self-realization, a

joint search for possible answers, an atmosphere of enthusiasm, a sense of feasibility of tasks really help people of all ages overcome the psychological barrier, get to know each other better, look at their comrades with new eyes. The intellectual game also allows people to prepare for work in the “brain-storm” mode, which is provided for by the script in some intellectual games.

The final “product” of an intellectual game can be represented in the following main varieties:

- object units (find the missing letters and words);
- objects classes (sort, classify objects);
- relations (establish connections between objects);
- systems (identify the rules for organizing multiple, several objects);
- transformation (change and transform the given material);
- implication (prediction of results in an uncertain situation)” [12].

Thus, for an adequate search, an important addition must be made: the intellectual games we are studying are inextricably linked with the form of their conduct. Indeed, the organizers and participants of the “WWW”-game describe this process, among other definitions, as a “game program”, “TV-program”, “TV-game” (in the context of “intellectual action”). We also note that the abbreviation KVN in Russian means “fun and resourceful club”, in which the adjective “fun” is in the first place, and the adjective “resourceful” is only in the second. That is, it is necessary not only to give an original answer to the task (this is important), but also, just as importantly, it is necessary to be able to present this in the form of an interesting presentation. More specifically, this is expressed in the methodological manual on organizing and conducting an intellectual marathon [13]: “an intellectual marathon has a combined scenario, which is a conglomerate of brain-ring games, “What? Where? When?”-game, elements of the KVN game, which makes it possible to make a creative game show that is as attractive and accessible as possible for students with different levels of intellectual potential”. At the same time, it is recommended that developers of new intellectual games take into account the communicative and substantive game aspects [14], and it relies on the educational and upbringing capabilities of such games [15]. We can consider a series of bigrams of this orientation.

“Play show”: the bigram has been dating since 1838, it is associated with theatrical or poetic productions. In modern times, it is additionally found in texts related to software (button or “Play show” mode).

“Game show”: the bigram has been found since 1858 (game show, music show), in modern times - any (not only intellectual) television game with prizes for the winners.

“Quiz show”: a bigram in modern times is a quiz show (to be discussed below). In English, the monogram “quiz”, unlike the monogram “Olympiad”, is not associated with physical exercise.

Thus, the term “intellectual game”, in our opinion and understanding of a number of authors, is closest to the English term “quiz”, which is carried out using such tools that are most appropriate for the tasks of the organizers, and with a possible form of presentation as a show (entertainment program for participants and viewers). At the same time, for example, other authors [12] indicate that an intellectual game can be with elements of “brainstorming” (the monogram “brainstorming”, but not “brainstorm” - this is from the field of neurology / psychiatry) when a new solution is required (divergent thinking). KVN-game is closer to a music show (“Game show”) than to an intellectual game (“Quiz show”). The show itself can take the form of audiovisual (video, action on stage in front of the audience, TV broadcast), visual (for example, pantomime) or audio (radio or audio recording).

Such a “game” as the verification test also falls into the range of “quiz” values (at school, university: written or via the Internet; we usually conducted in the form of various

dictations). Formally, this list should include the Unified State Exam and the State Final Certification in Russia; SSAT, SAT and ACT in the USA, A-level in the UK, etc.

To verify this opinion, one can cite multiple statements on this subject by A. A. Wasserman, the “veteran” of the “WWW”-game (until the 90s, the main prizes in the “WWW”-game were books, then the game became completely monetized, since 2002 the world championship among teams has been held by countries where people from the USSR live). For example, in an interview with A. A. Wasserman, intellectual games like “WWW”-game are practically a sport, and besides television broadcasts, there are more serious types of competitions [16]:

“... world championship on the project “What, Where, When?”-game exists for more than 13 years. In this sport, we have long ago determined how to check the level of participants’ development. This is done by compiling questions not on knowledge, but rather, an understanding of the processes taking place. All these questions, as a rule, correspond to the level of the comprehensive school curriculum. The issue has long been resolved at such events and with unauthorized access to the question material. Therefore, I would recommend that supporters and opponents of the Unified State Exam to pay attention to intellectual games, where all the problems that they discuss have long been resolved”.

Further in his interview, A. A. Wasserman notes: “The creative inclinations of a student can be revealed only by creative trials. For example, an essay” [16].

Here we note: a well-known expert believes that the exam can be correlated with options for intellectual games, despite the fact that such tools are not designed to assess creative processes. It is also important that A. A. Wasserman speaks of the different uses of intellectual games: only to test knowledge of facts and to test understanding of the existing relationships between individual facts.

4 Results

Thus, we can conclude: the form of an intellectual game can be “Quiz show” (a TV-quiz or quiz with the direct presence of the audience) or “Quiz program” (radio quiz). We should note that “Quiz play” is a quiz in the form of a game show, and “Quiz game” is a small-format game on a narrowly defined topic (s), which can take the form of a desktop quiz. An example would be the family game Walt Disney Quiz Game (based on the history of Disney studio and its work) or “Biology Challenge!: A Classroom Quiz Game” - a game for a class to test knowledge in biology.

The linguistic comparison of all “Quiz” bigrams allows us to conclude that the actual tasks (the essence of the intellectual game) are “Quiz”, everything else is the form of conducting (which correspond to the goals of the organizers in each particular case).

The rapid development of computer technology and the Internet have not qualitatively changed such an instrument as the “big game”, which, for example, can be carried out in the form of a television program. But these innovations were supposed to influence “small games”, such as quiz online (an interactive game), quiz game (a small-format game, which includes variants of a board and computer game), intellectual quest (intellectual quest).

5 Conclusion

Based on the analysis of literary sources, we found that the intellectual load during leisure time in the process of intellectual games allows to maintain a high level of mental activity until the end of life and prevent brain degradation. With such intellectual pursuits, a person can experience a state of “flow”, which M. Chiksentmihaii correlates with a feeling of “happiness”.

We described a modern tool for working with the Google Book Ngram Corpus - scientific materials database. With its help, connotations of intellectual games in the history of their development were considered. It was shown that intellectual games correspond to the English concept of “quiz”, which is carried out using such tools that are most appropriate for the tasks of the organizers, and with a possible form of presentation as a show (entertainment program for participants and spectators). Linguistic analysis of “Quiz” -bigrams confirmed the conclusion that the essence of an intellectual game in the English language format is Quiz (quiz), and everything else is just a form of such games. At the same time, the game may have tasks for convergent thinking (searching for one correct solution) or divergent thinking (all decisions are correct if they are new). This all has to do with “big games”, but we also discussed concepts related to “small games”: interactive, small-format and quests.

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