Positive Psychology Centered Online Studies

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***Abstract*—Flow (optimal) experience is a well-elaborated unit in positive psychology. This unit fits well many activities mediated by information and communication technologies. The paper covers the studies in the mentioned above area, which were carried out by Russian psychologists during the last decade. The empirical studies include the analysis of flow experience in online gaming and of its role in computer hackers' motivation; theoretical proposals refer to optimal experience in the web and software usability research and an appeal to differentiate Internet addiction and flow experience. The paper states that theoretical and applied work based on the optimal experience methodology is a promising perspective for online research.**

Keywords-flow; psychology; optimal experience; information technologies; online gaming; hackers; usability; addiction.

I. INTRODUCTION

From a psychological standpoint, virtual space is a human centric space, intermediate between a human being and others, between an inner and outer knowledge, between self and multiple selves. Being mediated by computers (or mobile vehicles) and the Internet, virtual space is characterized by its own inherent metrics (dimensions): neither *X/Y/Z* Cartesian coordinates with *up/down, left/right, and forward/backward* directions of movement, nor Einsteinian *spacetime* are easily and plausibly applicable in the virtual space. At the same time, the mentioned above genuinely scholastic dimensions are the ones which everyone who enters a technology-rich working environment expects to face.

Virtual spaces represent comfortable environments for almost everyone, especially for new generations, often called "digital generations", or "digital natives" [7], starting with an elementary school age or even earlier; virtual spaces are not any more the privilege of students and lecturers in computer science, engineers and all those who are engaged in academic work. To enter a virtual space, one need not leave either office or home, or both. Consequently, the dimensions describing virtual spaces need not be entirely scholastic any more; on the contrary, these dimensions are becoming more and more close to the ones which proved its usefulness in descriptions of contemporary industrial, office or home environments.

For example, the most part of the well-known dimensions of the habitual 3D space, such as for example an *office* area as opposed to a *living* and *sleeping* area opposed to a *recreational* area opposed to a *shopping* area opposed to an *interaction* area opposed to a *private* area (all the oppositions are not overwhelmingly strict, of course) have definite parallels in the virtual space. Indeed, the virtual space dimensions are in a way similar to what people are apt to do both in the habitual (physical, or real-life) space and in the virtual space, namely: *work, interact and make relations, play and recreate, learn and explore, go shopping, negotiate and gamble, save privacy*, etc.

Many people find these dimensions easy to follow; but there are those who believe the organization of the virtual space dimensions is far from being optimal. Very likely, this distinction reflects the life-style differences and corresponds to diverse human experiences. Anyway, what is known about attempts to optimize these dimensions? Optimization is dependent on numerous factors, such as economics, education, logistics, profession, personality traits, etc.; this Section however deals with psychology, and thus we will discuss psychological parameters of optimal forms of virtual space dimensions. In particular, some emotion-related dimensions such as *enjoyment* or *pleasure* are no less universal than the Cartesian ones, whenever people tend to make assessments of unknown spaces. That means, we are going to discuss in detail how well a psychological theory of optimal experience fits the virtual space.

In the paper, we review the current directions of studies and give a perspective of optimal experience related academic and practical work within the virtual environments. The review is centered on the studies which we have done during the last decade.

II. OPTIMAL (FLOW) EXPERIENCE: A BRIEF DESCRIPTION

Principles and methods of positive psychology [10] are widely used in the growing research field of human behavior in virtual environments. The most promising perspectives in positive psychology seem to be the Self-Determination theory developed by Deci and Ryan [2] and the optimal (flow) experience theory developed by Csikszentmihalyi [1]. The methods belonging to the positive

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psychology and particularly to flow experience relate intimately to the patterns of human behavior in virtual environments, such as interaction, learning and exploration, problem solving, gameplaying, shopping, etc. The history and the current status of the positive psychology studies referring to the virtual environments was recently reviewed [5][15]. The discussion in the review papers is restricted to the studies related to optimal experience theory, due to the fact that the studies related to virtual environments and influenced by the Self-Determination theory are not numerous: rather few publications deal with e-learning [9] or online gaming [8].

The feeling of finding oneself – mentally – in the midst of a torrent of liquid (especially running water) is not totally alien to psychological theory, taking into consideration traditional terms such as stream of consciousness or flight of ideas. The notion of flow has been introduced by Mihaly Csikszentmihalyi who interviewed hundreds of people (among them painters, athletes, physicians, dancers, scientists and many others), asking them to describe their feelings while carrying out their professional or hobby work. Each time when respondents expressed a really deep devotion to this or that sort of work (not necessarily pleasing and playful, often, on the contrary, hard and risky), their reports contained a common element, or metaphoric description of a sensational experience for which Csikszentmihalyi [1] could have hardly choose a name other than **flow**. Indeed, almost every respondent mentioned "flowing from one moment to the next, in which he is in control of his actions, and in which there is a little distinction between self and environment, between stimulus and response, or between past, present, and future" [1, p. 36]. Flow (both deep and rare flow events, and habitual *microflow* events) was reported to happen irrespectively of the type of the work: be it spiritual or mundane, creative or routine, unique or known to almost everyone, individual or team-work, rarely or regularly performed.

Csikszentmihalyi and his followers found that respondents never report of flow happening (and it is indeed a sort of a happening!) when they feel relaxed: on the contrary, to experience flow they need to be genuinely and deeply involved in the preferred work. People report they experience flow when they perform their work to the utmost and get a positive result: Csikszentmihalyi and other scholars would call it a **peak** performance. The necessity to achieve some success, which may be in fact quite moderate, explains the need to acquire, prior to experiencing flow, some competence, not necessarily very high, in performing the work. Respondents always describe flow as an **enjoyment**, which is characteristic of flow; in the lifespan they tend to remember such happenings quite well, sometimes decades after the experience itself. Clearly, within the positive psychology paradigm this sort of experience is called **optimal experience**.

Positive psychology is a universal psychological discipline; when applied in practice, however, it works probably best as a source of motivational theories: this refers both to the Self-Determination theory and to the theory of optimal experience. Neither is an exclusively motivational theory; both are used in practice as theories of **intrinsic** motivation. Various types of such motivation have been widely exploited while designing computer/Internet applications, as well as in the practice of self-regulation, management, education, etc. An intrinsically motivated process is self-rewarding, while its results might be (at least partly) irrelevant. In the optimal experience context a process, or a sequence of intermediate goal-directed efforts performed in order to achieve the desired result is quite often reported to be much more pleasing and self-rewarding than the result itself, when and if it is gained. Optimal experience has been called [1] **autotelic** (from Greek: self + goal), it means that the goal of doing some work is just the act of doing it, regardless of whether external rewards will follow. While an intrinsically motivated work brings *enjoyment*, Csikszentmihalyi refers an **exotelic** work and extrinsic motivation to *pleasure* which is a somewhat passive and relaxing feeling, compared to enjoyment, at least in the optimal experience context. No doubt, the achievement of pleasure, and respectively the extrinsic motivation (in the form of money bonuses, lovely sex partners or increases of power) have always been an incomparably strong stimulus of diverse human activities. Positive psychology suggests, nevertheless, that neither intrinsic stimuli nor enjoyment should be underestimated; successive managers try to combine the two types of motivation to stimulate the employees.

III. FLOW CHARACTERISTICS AND DIRECTIONS OF STUDY OF OPTIMAL EXPERIENCE IN THE VIRTUAL ENVIRONMENTS

Theoretically and empirically, Csikszentmihalyi [1] selected the following major – or the most common – **characteristics of flow**:

- ✓ *clear and distinct objectives;*
- ✓ *temporary loss of self-consciousness;*
- ✓ *distorted sense of time;*
- ✓ *actions merging with awareness;*
- ✓ *immediate feedback;*
- ✓ *high concentration on the task;*
- ✓ *high level of control over the task;*
- ✓ *balance (precise matching) between the available skills and the task challenges;*
- ✓ *full satisfaction, while doing work, which is worth doing for its own sake*.

This set of characteristics proved to be applicable in diverse environments [1], including the use of information and communication technologies: the relevant studies took a start in early 1990s [8][9]. In the virtual environments, which are the main point of interest in the current paper, the most frequently suggested characteristics, additional to the

mentioned above, include (see the appropriate references at [15])

- ✓ *presence* ("mediated perception of an environment" or "being there – in a somewhat different place", as well as "possibly sharing this place with other people", and finally "immersion"), and
- ✓ *interactivity* (distinguishes new – responsive – media from traditional media).

Each of the two additional characteristics has been intensely applied and investigated in empirical studies and often proved its usefulness. One can formulate that characteristics such as *presence* and *interactivity* are among the most needed within the virtual environments, partly due to the fact that these characteristics are inherently related with the information and communication technologies. In a book chapter written with Shernoff, the originator of flow related studies accepts recently proposed characteristics such as "presence" or "being there" as well as "immersion", and makes it evident that "flow theory has been the natural theoretical base for exploring the implications of learning through immersion in … virtual learning environments since the emotional composition of these experiences resemble the flow state and precipitate a deeper engagement with learning" [11, p. 141].

The practice of the use of new information and communication technologies represents a variety of areas to study flow experience. From the very beginning [4][13] the studies of optimal experience in the virtual environments referred to 'computer-mediated communication', 'online, 'computer based instruction', 'Web use', 'human-computer interaction', 'computer-mediated environments' related to marketing, 'information and communication technology use', 'activities involving information technology,' 'human-computer interaction' or 'Internet/Web use'.

When classified, the major areas of the use of the flow experience methodology in virtual environments are the following [15]:

- Online marketing and shopping,
- E-learning/teaching,
- Cyber-recreation (most often, online, computervideo gaming),
- Virtual interaction.

These research areas do not differ from traditional directions of studies which are being carried out in psychology of cyberspace. Additionally, less elaborated research areas include [15], and are partly discussed in the paper:

- Virtual psychological rehabilitation, such as immersive systems of virtual reality;
- Illicit penetrations into the virtual space environments and computer security regulations;
- Usability testing, measurement of a web-site attraction and friendliness, adaptation of web sources to target populations.

In this paper, we are not going to discuss all the mentioned above directions of the studies and applied work. Instead, we will limit with the description of the studies held in the field by the author and his colleagues and students during the last decade. In spite of the fact that the most part of these studies have been held in Russia within the last decade (see the appropriate descriptions and links to the references in Section IV), we believe that the results are cross-cultural by their nature.

IV. EMPIRICAL STUDIES OF FLOW EXPERIENCE IN THE VIRTUAL ENVIRONMENTS

A. Theoretical Proposals

In this Section we are going to discuss two proposals which lack empirical support to be done by the author. First, we will discuss the need to connect the optimal experience methodology with applied work traditionally done within the projects targeted at the development of new software products, namely the work which is known as usability testing. The second point to be discussed in this Section deals with a possible though non-likely (as it is stressed further in the Section) correspondence between the flow experience and the Internet addiction disorder (also known under diverse names, such as for example Internet overuse, Problematic Internet use, Pathological Internet use, Internet abuse, or Compulsive Internet use, etc.).

Current methodology of usability testing should rely on longitudinal research and on field studies. When a longitudinal fieldwork usability project is being carried out, it is preferable to investigate the users' intrinsic motivation which has the highest prognostic value. On the contrary, traditional lab settings are optimal to investigate extrinsic motivation; since intrinsic motivation is unlikely to be revealed while carrying out a traditional type of usability-related work, the importance of motivational research has been largely underestimated.

A promising approach toward better understanding of specifics of intrinsic motivation is a flow paradigm [12]. Good match between the software users' needs and skills, on the one hand, and the inner structure of programming tools, on the other hand, means that the choice of the "next step" while fulfilling the task needs to match the (possibly) increased skills.

The usability practice faces the problem of checking whether customers keep experiencing flow in a long perspective. Usability engineers need an advanced specialized methodology to apply in field work. In the information and communication technologies field, special software can be developed to assist the participants in reporting particular characteristics of flow, or alternatively, the absence of these characteristics. This methodology seems to be extremely promising for carrying out

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longitudinal fieldwork, including software users' motivational research [12]. The alternative models, which are widely used to evaluate usability of software products, only rarely rely on a registration of indisputably fundamental type of human needs such as intrinsic motivation. Due to this fact the suggested method of usability studies can be used either parallel to other methods, or alone. Even in the latter case, one may expect the results to be exceptionally reliable. When an applied usability study involves longitudinal evaluation, the methodology of optimal experience is really promising, irrespectively of how many alternative methods are being used.

The second point to mention refers to the Internet addiction disorder in relation to the optimal experience. Indeed, there is a growing body of evidences – mostly referring to gameplay activities – in which flow experience is correlated with the Internet addictive behavior (see appropriate references in [14][15]). At first glance, there is indeed some reason to correlate the two types of experience, related to addiction and to flow, since repetitive behaviors characterize both types of activities. Nevertheless, flow is an example of a *positive optimal* experience and it is hardly compatible with addiction or psychological dependency, typical for a *negative* kind of experience [14][15].

Repetitive behavior referring to a negative type of activities, such as intakes of drugs, passive leisure activities or abuse of technological artifacts, including computers and computer games, is derived from the so-called *mimetic flow* [6], i.e. non-genuine flow experience. Alhough it may result in replications of a familiar behavior, the psychological nature of mimetic flow is dissimilar with the nature of optimal experience, as it was described earlier in this paper. Thus, the Internet addiction and flow experienced while using the Internet differ in their inner psychological structure; this theoretical statement is apt to get an empirical support, i.e. evidences that flow experience correlates negatively to Internet addiction disorder.

B. Flow in Computer Hackers' Activities

The study of optimal experience patterns in computer hackers' behavior was done as an online study [19]. The study rests on an idea that in order to experience flow a balance is needed between the level of software use (not specifically hacking) skills and the level of challenges (or task choices) in hacking.

A hacker's development might be presented in the following way. The relationship between hackers' experience and flow is complicated. Flow does not linearly increase with the increase of the hackers' competence. Periods of flow experience turn to periods of flow crisis and then to periods of flow renovation. In the post-experimental interviews the role of task choice in experiencing flow while hacking is revealed. The step-by-step task choice often leads to close matching of task challenges and skills, marking flow experience.

An inexperienced hacker (a beginner) might find a matching combination of challenges and skills and start to experience flow. The flow motivation is strong, and the beginner feels comfortable. A hacker might stay at this stage for years. To stay at a beginner's stage means that neither skills nor challenges develop in a significant way.

A beginner hacker might progress in at least **three** ways. The *first* is a step-by-step progress both in challenges and skills which keep matching at every developmental stage. The progressing hacker keeps experiencing flow all the time. The cases of fine skills/challenges correspondence at every stage are probably infrequent. *Second*, a hacker gains new skills and lacks the correspondence of new skills to non-updated challenges. Or, *third*, a hacker takes high challenges and finds he/she lacks non-updated skills. These two ways of a hacker's progress result in periodical dropouts of the flow range, and the hacker periodically stops experiencing flow. Constant matching of skills and challenges and non-interrupted flow seems to be a hard way of progressing.

If an inexperienced hacker increases challenges, he/she turns to become a wannabe hacker, at least for a certain stage of his/her development. A hacker might stay at this stage long enough, trying to acquire prestigious goals and never acquiring them. A wannabe hacker's rewards might lie in the social life: he/she might boast and get some social prestige. To renovate the flow experience, a wannabe hacker might either lessen challenges and to become an averagely competent hacker setting moderate challenges, or update skills to become a highly qualified hacker with challenges matching the available skills.

If an inexperienced hacker increases skills, he/she looses the fine matching of challenges and skills. His/her skills overrun his/her challenges until the challenges are not updated. When updated, the flow experience might come back at a higher level of skills/challenges correspondence. Former hackers often turn into computer security officers; that means they loose motivation to pose high challenges in hacking.

The study, which was briefly described in this Section, shows first, that the hackers' motivation includes experiencing flow, and second, that the hackers' motivational development is strongly dependent on flow experience while this development includes longer or shorter periods of interruption and/or dropout periods when a hacker ceases to experience optimal forms of motivation.

C. Flow Experience in Online Gaming: A Cross-Cultural Study

Online gaming is among the most popular patterns of use of online services. One of the potential reasons of this popularity is that the gamers are fond of playing video and online games due to the fact that they experience flow while they perform gameplay. This reason was investigated in a number of studies, including a cross-cultural Russia/France/USA/China (the latter study is still in

progress) study with an identical methodology. In all the studies the methodology is the same: first we worked out a comprehensive questionnaire in Russian, and after it proved to provide reasonable results, this flow-related questionnaire was adapted to be used in different ethnic communities of gamers [3][16][17][18].

Each time we performed translations and back translations until the questionnaire proved to be adequate. The methodology included online administered surveys; we did not seek gamers playing identical games since we needed replies from the ethnic communities of gamers who played the whole continuum of online games. Here is some statistics related to the results gained in the series of multiethnic factor analytic studies. The Chinese data are nowadays being studied anew since the gamers' population is steadily growing, and the data need to be re-studied on the current stage of development of the Chinese gamers' population.

Every particular ethnic-specific factor model proved to be reasonably good; moreover, the factor structures seem to be similar in many ways. Most important, each factor model includes a factor such as 'flow experience', mostly as the first factor (except for the French sample). The results are represented in the following table (see Table I).

TABLE I. COMPARISON OF FACTOR MODELS RELATED TO ETHNIC SAMPLES OF ONLINE GAMERS

Ethnic Samples	**Russians** N = 347	**Chinese** N = 133	**French** N = 202	**Americans** N = 287
Factor 1	Flow	Flow	Achievement	Flow
Factor 2	Achievement	Achievement	Interaction/ Cognition	Achievement
Factor 3	Activity/ Passivity	Spend Time	Flow	Cognition
Factor 4	Interaction	Interaction		Self-Control
Factor 5	Thoughtful/ Spontaneous			Interaction
Factor 6	Cognition			

The relevant factor structures cannot be presented and discussed in this paper in detail; confirmatory factor analysis was done in the appropriate empirical studies. The thorough analysis is presented in the papers [3][16][17][18].

The factor structure of the Russian gamers is the most complex (among the samples we investigated) and contains more factors (namely, six) than the factor structures of the other ethnic groups of gamers. All the factor structures are well-established and reasonable; flow is the first factor in almost all the models, with the single exception of the French population of online gamers. The corresponding factor model for the latter sample contains only three factors, which looks minimalistic among the factor structures we examined.

The French sample seems to be even more peculiar since Cognition and Interaction merge into one factor. A likely supposition is that the members of the French sample are fully aware of the fact that interactions with other players provide a chance to exchange and share in-game experience, which is equivalent to performance of cognitive actions in a comfortable manner. Indeed, within the research project we discuss, cognition refers to knowledge useful for making game-related decisions; in an online multiplayer mode of gaming, social perceptive knowledge pertaining to other players is no less valuable than information about the specifics of gameplay structure; exceptionally useful knowledge referring to social perception of partner players can be gained by means of interactions with them. Due to this fact the interactive mode of online gaming is highly appreciated by players. Turning to the factor model characterizing the Chinese sample it is evident that the members of this sample are the only ones (among those investigated) who seem to underestimate processes of collecting knowledge: in the corresponding factor model there is no factor responsible for cognition.

Conclusions such as the mentioned above become evident after the elements of factor models which have been gained in the process of carrying out particular culture-related studies are organized in a table format. This format seems to be helpful: even simple comparison of the existing factor structures can provide hints for new hypotheses. For example, one of the reasons to perform a new mentioned above study within the same project, namely the study dealing with a rapidly growing population of Chinese online gamers, is our intention to find out whether online gamers from China still keep restraining from cognition while gaming.

The main result of the cross-cultural study says that flow experience seems to be an important and significant factor in online gaming and is one of explanations of its ever growing popularity.

V. CONCLUSION

Flow experience, or optimal experience, as introduced by Csikszentmihalyi, takes an important place in the field of the use of information and communication technologies. In a number of theoretical and empirical studies this view got a sufficient confirmation. A portion of significant studies in the field has been done by a team of psychologists from Russia; in the current paper this contribution to the field has been overviewed briefly. A thorough and fairly recent review of the world-wide studies devoted to the use of optimal experience methodology in virtual environments is presented elsewhere [15].

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It has been shown that flow experience is a common motivating element for online gamers in four different ethnic groups such as Chinese, Americans, French and Russians. This proves the fact that optimal experience is a basic element in one of the most well-grounded explanations of world-wide attractiveness of playing massive multiplayer online role-playing games, and very likely other types of video and/or console games.

A nonlinear model of the development of computer hackers' flow experience has been worked out: flow depends on the balance between the challenges the hackers take and the skills they possess (skills in competent computer usage, not necessarily in the use of specific software programs for hackers). Flow is shown to develop in a step-like manner which includes "flow crisis gaps", i.e. shorter or longer time periods during which hackers do not report of optimal experience. The flow crisis gap periods are promising for the hackers' dropouts: their eventual transformation into non-hackers, possibly (but not necessarily) into experts in computer security; such a transformation may happen when a hacker becomes preoccupied with mastering his or her skills in computer science and/or software development, and is losing interest in new hacking related challenges. This model shows prospective directions of educational work aimed at reducing the number of computer hackers by transforming them into qualified experts in computer science, including for example the problem area of computer security, or any other problem area which responds to their particular interests.

Flow experience is a complex motivational state and should not be confused with some other psychological states, such as for example a computer/Internet addiction. Flow belongs to entirely positive states which are often easy to be mixed up with creativity, while any addiction is commonly believed to be a psychological state which is desirable to get rid of. It is shown in the current paper that optimal experience is a valuable parameter to be used in performing web/software usability studies.

For the youngest generations – those *born digital* – as well as for the representatives of older generations the cyberspace is becoming more and more habitual, just the space for doing office work, for learning and exploration, for spending leisure time, for interactions, for shopping, for self-presentation, for diverse forms of entertainments (first of all – gaming, viewing videos and movies, uploading photos and videos), etc. It is essential that this virtual space should be comfortable and easy-to-operate, both emotionally and ergonomically. The optimal experience theory developed by Csikszentmihalyi represents an underestimated (in the earliest practice of designing the cyberspace) dimension which might be helpful, as is shown in the current paper, in constructing the virtual spaces which are emotionally comfortable; besides, the current paper shows that this theory provides valuable targeted hints for performing high-quality usability related studies and for applied work aimed to enhance the comfort and effectiveness of using both current and prospective software products.

Thus it means that flow experience should be considered one of the major and most constructive dimensions pertinent for estimating new and old virtual environments and for designing/redisigning these environments. The notion of flow is an entirely human-centric dimension of virtual environments, and from now on this dimension should not be underestimated. Both scholars and producers of new technologies need to work jointly in order to establish reliable standards to ensure that the would-be users of prospective virtual environments are likely to experience flow. This type of theoretical and empirical work, while being of global importance, suggests that it might be performed in a series of cross-cultural projects; the current paper illustrates a particular pattern of such a project.

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REFERENCES

[1] M. Csikszentmihalyi, Beyond boredom and anxiety: Experiencing flow in work and play. San-Francisco: Jossey-Bass, 2000 (first published in 1975).

[2] E. Deci and R. Ryan, Intrinsic motivation and self-determination in human behavior. New York: Plenum Press, 1985.

[3] A. Faiola and A.E. Voiskounsky, "Flow experience of MUD players: Investigating multi-user dimension gamers from the USA," Lecture Notes in Computer Science, vol. 4564, 2007, pp. 324-333.

[4] J.A. Ghani and S.P. Deshpande, "Task characteristics and the experience of optimal flow in human-computer interaction," The Journal of Psychology, vol. 128(4), 1994, pp. 381-391.

[5] D.L. Hoffman and T.P. Novak, "Flow online: Lessons learned and future prospects," Journal of Interactive Marketing, vol. 23(1), 2009, pp. 23-34.

[6] F. Massimini and A. Delle Fave, "Individual development in a bio-cultural perspective," in American Psychologist, vol. 55(1), 2000, pp. 24-33.

[7] J. Palfrey and U. Gasser, Born Digital: Understanding the First Generation of Digital Natives. N.Y.: Basic Books, 2008.

[8] A.K. Przybylski, C.S. Rigby, and R.M. Ryan, "A motivational model of videogame engagement," Review of General Psychology, vol. 14, 2010, pp. 154-166.

[9] J.C. Roca and M. Gagne, M. "Understanding e-learning continuance intention in the workplace: A self-determination theory perspective," Computers in Human Behavior, vol. 24(4), 2008, pp. 1585-1604.

[10] M.E.P. Seligman and M. Csikszentmihalyi, "Positive psychology: An introduction," American Psychologist, 55(1), 2000, pp. 5-14.

[11] D.J. Shernoff and M. Csikszentmihalyi, "Flow in schools: Cultivating engaged learners and optimal learning environments," in Handbook of Positive Psychology in Schools, R. Gilman, E. S. Huebner, and M. Furlong, Eds. New York: Routledge, 2009, pp. 131-145.

 ISBN: 978-1-61208-167-0

[12] O.V. Smyslova and A.E. Voiskounsky, "Usability studies: to meet or not to meet intrinsic motivation," PsychNology Journal, Vol. 7, № 3, 2009, pp. 303–324. Retrieved March 14, 2010, from http://www.psychnology.org/File/PNJ7(3)/PSYCHNOLOGY_JOURNAL_7_3_SMYSLOVA.pdf

[13] L.K. Trevino and L. Webster, "Flow in computer-mediated communication," Communication Research, vol. 19(5), 1992, pp. 539-573.

[14] A.E. Voiskounsky, "Two types of repetitive experiences on the Internet," INTERFACE: The Journal of Education, Community and Values, vol. 7, issue 6, 2007. Retrieved February 21, 2011, from http://bcis.pacificu.edu/journal/article.php?id=174

[15] A.E. Voiskounsky, "Flow Experience in Cyberspace: Current Studies and Perspectives," in Psychological Aspects of Cyberspace: Theory, Research, Applications, A. Barak, Ed. N.Y.: Cambridge University Press, 2008, pp. 70-101.

[16] A.E. Voiskounsky, O.V. Mitina, and A.A. Avetisova, "Playing online games: Flow experience," PsychNology Journal, Vol. 2, № 3, 2004, pp. 259–281. Retrieved October 22, 2008, from http://www.psychnology.org/PSYCHNOLOGY_JOURNAL_2_3_VOISKOUNSKY.pdf

[17] A.E. Voiskounsky, O.V. Mitina, and A.A. Avetisova, "Communicative patterns and flow experience of MUD players," Int. J. Advanced Media and Communication, Vol. 1, № 1, 2005, pp. 5-25.

[18] A.E. Voiskounsky, O.V. Mitina, and A.A. Avetisova, "Flow experience and interaction in online gaming: Comparative study of Russian and Chinese MUD players," in Sixth international conference on Cultural Attitudes Towards Technology and Communication 2008, F. Sudweeks, H. Hrachovec, and Ch. Ess, Eds. School of Informational Techology Murdoch University, 2008, pp. 410-421.

[19] A.E. Voiskounsky and O.V. Smyslova, "Flow-based model of computer hackers' motivation," CyberPsychology & Behavior, Vol. 6, № 3, 2003, pp. 171-180.

 ISBN: 978-1-61208-167-0