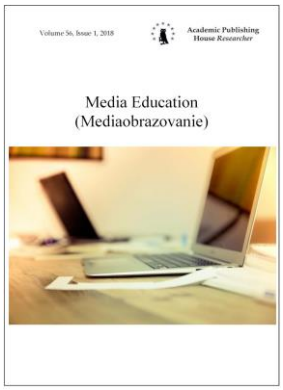
Copyright © 2019 by Academic Publishing House Researcher s.r.o.

Published in the Slovak Republic
Media Education (Mediaobrazovanie)
Has been issued since 2005
ISSN 1994–4160
E–ISSN 1994–4195
2019, 59(1): 86–92

DOI: 10.13187/me.2019.86
www.ejournal53.com



The Impact of Digitalization of Network Space on Journalism Education

G.S. Melnik [a, *], A.N. Teplyashina [a]

[a] St. Petersburg State University, Russian Federation

Abstract

The article highlights the problems of transformation of journalistic education, which today is changing along with the highest schools and, of course, with journalism and modern media systems. A significant reason for the modern changes is related to the multidirectional vectors of the creative nature of journalism and its existence in the media market. The article discusses the essence of the concepts of "multimedia" and "multimedia technologies", describes the pedagogical conditions for the introduction of multimedia technologies in the educational process of higher education and discusses the possibility of their use in teaching students. The active introduction of multimedia technologies in educational programs in journalism is the most important factor in the modernization of education. Currently, these technologies are among the most dynamically developing and promising areas in the field of digital media. The content of the offered article does not exhaust the whole range of problems associated with the introduction of multimedia into the educational process; we suggest considering only some possibilities of their application in teaching students. Convergence, digitalization, significantly changed the nature of the work of a journalist. Modern editors are waiting for multifunctional specialists today who combine the skills of a creative worker, author, editor, and distribution manager of an information product. In the standards of the new generation, additional competencies appear.

Keywords: mass media, mobile applications, mobile editions, multimedia hypertext

1. Introduction

Forming the students competencies, it should be borne in mind that a modern journalist works in conditions of rapidly developing technologies of searching, receiving, processing and transmitting information (Bennett, Senor, 2017). Modern journalistic education is characterized by practical orientation. The journalistic profession is highly technological in nature, therefore it requires strengthening and constant modernization of this component of education. Journalism education today is changing with the highest education and, of course, with journalism and modern media systems. The significant reason for the modern changes is related to the multidirectional vectors of the creative nature of journalism and its existence in the media market. Overcoming dissonance is associated with the development of a wide range of knowledge and skills that are laid in the educational process. The task of forming the competence of a future journalist and bloc organization of the curriculum has long been included in the practice of journalistic universities of the country, but now this approach requires the addition of new forms.

The global freedom of access to the networked communication space implies the freedom to offer and select information, create resources. The introduction of new information technologies

* Corresponding author
E-mail addresses: melnik.gs@gmail.com (G.S. Melnik), a-nik@list.ru (A.N. Teplyashina)

fundamentally transformed the kinds and types of journalism, changed the nature of the interaction "communicator–recipient", "communicator–audience." According to the Facebook resource, an Internet user spends at least 55 minutes a day in social networks, with about 230 friends, which is 10 times more than in real life (Saras, 2008).

In the last decade, the popularity of mobile Internet access is growing. According to the results of researches of the company "Opera Software", the number of Internet users through mobile browsers worldwide is increased by 150.000 people a day (Opera Software). According to the research firm The Nielsen Company in Europe, the Internet is regularly visited using the mobile phone by over 30 % of Internet users. In the United States, mobile Internet is used by 19 % of respondents, in the UK – 24 %, in Spain – 26 %, and in France, the Internet in a mobile device is already used by 28 % of residents. Significant penetration of the mobile Internet was noted in Germany and Italy (34 % in each country). Mobile Internet services are becoming part of the everyday life of people, giving them the opportunity to access a wide variety of information products. Enterprising publishers of newspapers and magazines, using the capabilities of mobile devices to transfer structured information, seek to offer readers original content – operational news about the most important, relevant events.

2. Materials and methods

As researchers of new media rightly point out, scientists inevitably face the need to review critically the main theoretical and methodological paradigms and methods used in research in order to form an understanding of the scientific direction within which it is possible to conduct modern studies of journalism and media (Fuchs, Qiu, 2018).

Fundamental changes occur not only in the collection, processing, distribution and storage of mass information, but also in the practices of reading and consuming information. Today, researchers say not just about the traditional media presence effect, but also about the effect of participation, because publishers offer audiences various options for obtaining information, which allows users to influence the content of messages. Publications structured according to the principle of a classical printed publication perform the same functions, but they have great possibilities: high level of efficiency and interactivity. Individual activity arises: a person operates with information, compares data from different sources and leaves his comments on media messages (Pronin, 2002).

3. Discussion

The controversy about the status and theoretical apparatus of digital media communication in the educational process, developed in scientific journals, indicates the desire of the research community to study the actual problems of media education (Gikas, Grant, 2013; Vrielink et al., 2018; Gebremariam et al., 2018; Lozada–Martínez et al., 2018; Erhel, Jamet, 2019). The theoretical and conceptual apparatus is contained in the foreign, mainly Anglo–American academic discourse. In the context of globalization, the appeal to the Anglo–American studies becomes an inevitable process. In one way or another, national schools of journalism and media studies are not only integrated into foreign media studies, but also acquire a single dynamics of development, find common research priorities and methodological foundations in the global research community.

R.O. Vrielink et al. (Vrielink et al., 2018: 234–245) argue that the current dominant way of learning in the field of education does not comply with many aspects that prevents innovation and effective implementation of emerging educational paradigms, and offer a new concept of logistics education M. Ghebremariam et al. (Gebremariam et al., 2018: 157–170) focus on the positive aspects of the use of information technologies in education They write that digital media and e–learning systems have played an important role in both the learning content and the learning platform to improve access to education and the quality of learning. The article "Enhanced Agility of E–Learning Adoption in High Schools" studied the practice of including the discipline "digital media" (a combination of text, images, audio and video) in the curriculum of secondary and higher schools. In our opinion, there is a need for a more in–depth study of the possibilities of multimedia resources in the field of media education; study of the already accumulated experience of using multimedia technologies in the learning process. The attempts of these scientists to demonstrate the results of the use of multimedia in the organization of media education are interesting. Nevertheless, it should be noted that in many schools there is limited access to multimedia

resources and the inclusion of the discipline "theory and practice of digital media communications" in the curriculum takes time. Also, it takes time to develop a flexible model that allows you to constantly capture the developing technological innovations and to study the experience of the introduction of digital media communications in the curriculum.

The goal of the J. Gikas and M.M. Grant study was to identify the effectiveness of teaching methods for students in three US universities to search for information in social networks using mobile phones and smartphones (Gikas, Grant, 2013: 18–26). Unfortunately, the article presents only a part of the conclusions on the impact on the level of knowledge of the latest educational technologies related to digital media. However, it is worth paying attention to two points related both to the advantage of gadgets integrated into the educational process, and to some students' disappointment regarding their effectiveness in the search for information. Following J. Gikas and M.M. Grant, we emphasize that the use of digital media to search for information in social networks creates the opportunity for continuous participation in public affairs.

The obvious advantages of mobile Internet are still being criticized. Thus, A. Mangen at al. (Mangen et al., 2013) argue that reading the digital text creates a new form of mental perception, in which the reader loses the sense of quantity and integrity, as well as continuity and connectedness. In addition, various physical manipulations with the computer (clicks, scrolling, etc.), which do not have immediate tactile contact with the material substance of the text (as in the case of reading a paper text) influence the form of perception. All these moments, according to A. Mangen, have a negative impact on such mental cognitive processes as attention, memory, and thinking. Analyzing polycode hypertext, A. Mangen concludes that multimedia hypertext does not contribute to the development of such a higher mental function as the imagination (Mangen et al., 2013).

Nevertheless, most analysts believe that "the mobile Internet is becoming a new way of life, creating an information society of the future" (Li, 2016). Researchers are interested in the emergence of a new segment of the media system in Europe, the functioning of popular mobile newspapers *Mr. Reader, Early Edition, Digital Post, EU Reporter, SAPO News, NPR, Blaster, World Earthquake Map, Terra News, TweetMag, News.me*, as well as media security issues for local networks. In large quantities, there are also scientific articles in which the authors try to comprehend and understand new opportunities for obtaining a high quality information product. Even "mobile labor interactions" under conditions of energy – intensive relations are subjected to analysis (Moskvina, 2012).

New digital technologies radically changed the existing traditional media. In fact, a new world of journalism has appeared, which in many respects has proved to be more versatile than its traditional counterpart, and considerably exceeds the capabilities of conventional media. However, it is much more important for mobile applications to identify correctly their potential audience. According to V. Dubinin, the founder of *AdWired*, "people's attention has shifted from paper to the Internet over the past 10 years, and the flow of audience from the Internet to mobile devices is even faster. Much faster than the industry understands itself. Currently, at least 25 % of traffic falls on mobile platforms (on average for the media)" (Dubinin, 2016). A new generation of readers, formed in an overabundance of information, has learned to maneuver in the flow of information precisely thanks to the capabilities of mobile newspapers. Responding to the requests of a new audience, publishers are forced to take care not only of the original content, but also the tools for its production. Access to operational information can be provided if a user has a mobile phone, a pocket personal computer or a smartphone. To ensure the connection between the phone and the computer with the consumer, it is enough to have Bluetooth, an infrared port or a data cable.

Mobile devices designed to disseminate journalistic information have many advantages: 1) they have small dimensions; 2) light weight; 3) are really mobile; 4) provide an autonomous way of communicating with the audience, even in those places where the use of an ordinary connection is completely unacceptable – on a business trip, on vacation, at a restaurant or at a business meeting; 5) enable you to create separate versions for different platforms and devices; 6) provide the association within the campaign in case of simultaneous release of interactive (mobile) and paper versions, rather than stimulating the sale of information products.

Without going into the technical side of the matter, let us evaluate the possibilities of mobile Internet for the content of publications. Summarizing the advantages of mobile publications identified by researchers, one can single out the following: a) preservation of the audience (contact 24 hours a day, 7 days a week); b) increase in advertising sales; c) reduction of costs for the delivery of information to the user; d) reduction of printing costs, intermediaries providing marketing and

sales of paper copies and related logistics costs; e) high level of efficiency and interactivity; f) offer various options for obtaining information; g) influence on the content; h) thanks to the technical features of mobile newspapers, the reader can select the information of interest to him in text, audio, visual or multimedia form and respond quickly to it; i) the content of mobile newspapers is well structured, thanks to the work of search engines and RSS feeds is easy to process and always available ; j) the reader is relieved of searching for the desired number in the kiosk or from subscribing to the post, and it is often easier for consumers of public transport services to put something like an iPad mini in a handbag than a regular paper issue of a thick magazine; k) indirectly contribute to the protection of the environment; l) not only expensive tools with a wide range of functions are used, but also simple applications of a moderate price range.

In terms of content, the mobile interactive edition includes several presentation formats and is a multimedia product that includes text, illustrations, interactive elements, videos and a unique soundtrack. A mobile publication can be a separate application, or be part of a print or Internet version.

There is another explanation of the definition. "Mobile edition is a new information media channel. The mobile edition (newspaper, magazine) is a mass media device adapted for use on a mobile device, structured according to the principle of a classical printed publication, which performs the same functions but has great possibilities: high level of efficiency and interactivity, and also offers the audience various options for obtaining information and allows to influence the content" (Moskvina, 2012).

Standards for the industry of publishing applications that have content delivery features, push notifications and technical requirements are being developed, for example, speed requirements. Examples of the world's successful print campaign in the mobile world are business media campaigns. About 80 % of European newspapers and magazines began to publish a mobile version. Mobile applications are popular to such publications as the *Wall Street Journal, Financial Times, New York Times, Early Edition, Digital Post, EU Reporter, SAPO News, NPR, Blastr, World Earthquake Map, Terra News, TweetMag, News.me*. Russian *Vedomosti* and *Kommersant* successfully operate in the mobile segment. The main secret of success is quality content, which provides standards for news applications. The mobile audience of Forbes magazine and news feeds, as well as the newspapers *Gazeta.ru* and *Championat.ru, News 36014*, are satisfied with the content.

The introduction of new mobile technologies radically transforms the kinds and types of journalism, changes the nature of communication with the audience. V. Dubinin insists that the publications complement each other. "It's a misconception that mobile sites and applications "take away" the audience from a large site," he said. "In fact, they increase the audience ... they offer the consumer an interesting picture of the world, which the user can cut out according to taste preferences and interests" (Dubinin, 2016).

O. Moskvina analyzed the content structure of many foreign mobile publications. The information is most often presented by several sections: news, politics, international news, regional news, economy, show business, technology, culture and sport, society and opinions, news of the automotive and telecommunications market.

The function "regional news" of a number of West European publications is especially noteworthy. The site will find the location of the user, give him the entire selection of news from this region, a map of traffic jams, and turn on a navigator if necessary. Each region of a country has its own mobile tab– newspaper, links to which are contained on the main page of the mobile version. All the most interesting events and hot news of the regions are collected on the internal pages of these sections, with a breakdown of the news feed and services by cities. The interactive photo archive makes a picture of the day, represented by the mobile version, more voluminous, reproduces detailed photoreports of the events that took place.

As for the content of mobile newspapers, publishers and marketers do not have a common opinion. The head of the Interfax Internet projects service Y. Pogorely emphasizes that only a small part of the audience is looking for reliable information (Pogorely, 2015).

Analyst of the network resource *VKontakte* A. Usmanov believes that to date, the channels that are accustomed to be allocated by media (site, social network, print edition, TV), are equivalent to the consumer: he can receive information from different segments, depending on the situation. In social networks, users select content in the news feed that they consider relevant for

themselves now, paying attention, first, to the comprehensibility of the presentation. At the same time, he should receive the information he expects from this media" (Usmanov, 2015).

Analysts also note one of the notable trends – an increase in the number of local and regional newspapers that want to be available on a mobile phone and attempt to make mobile sites or produce a mobile version of their publication. Indicative in this respect is the experience of Scandinavian media, especially Sweden – in the country, more and more newspapers offer mobile viewing of information. Scandinavian media have benefited from the early and active dissemination of mobile platforms (let us recall the successes in this direction of *Nokia* and *Ericsson* even before the advent of smartphones). Supported by numerous paid services, publishers of Northern Europe have learned to extract substantial profits from mobile traffic. *Facebook* also has successes in the mobile segment. According to the latest data from *TBG Digital*, the click through rate (CTR) of advertising in mobile newsfeeds is 23 times higher than in desktop advertising (CTR is 1.290 % vs. 0.049 %, respectively) (Philo, 2012). In an interview with C. Buren, business development manager IFRA–Sweden and the author of the IFRA special report "Mobile services" from the magazine "Strategies and practice of publishing business. IFRA– GIPP Magazine" states "a mobile newspaper is not a matter of the future, but of the present. The mobile phone is the ideal new platform for publishers and advertisers" (Buren, 2009).

At the same time, estimating the market of mobile publications, the head of the Bureau of Content Marketing A. Rodionov convinces us that 99 % do not need their own mobile applications and mobile versions of sites when it comes to publications with a small audience. If you do not offer readers much more than news and articles, it makes no sense to multiply the essence unnecessarily, and suggests creating adaptive sites so that users can comfortably consume content from any device, referring to the experience of the Los Angeles Times (Rodionov, 2014). Marketer A. Rodionov outlines five principal points in the solution of this problem:

1. Cross–platform – in order to simplify the software product and promote it, it is offered to create a site on the World press platform using an adapted template for publishing news. An alternative to a mobile application can be the presence in the main news in *Google*, for which it is suggested to prepare carefully the RSS feed.

2. Multimedia stories (snowfalls). It is important to fill the content not only with interactive maps, navigation, crossword puzzles, weather forecasts, etc., but also with expressive tainlines, for which it is necessary to involve bloggers and creative people who are capable of artistic embodiment of the idea. The structure of the general text combines several short stories (inside the material a separate menu is offered). An example of such publications as *The Verge, Forbes* and *Oz* is given. Of course, all advertising materials have the appropriate markers, so that the editorial staff does not mislead the audience.

3. Sponsorship content. Since people try to protect themselves from banners and applications that hide them (that is, they do not click), the income from placing banners does not go to any comparison with the profit from the usual printed "mock–ups". The task is to help brands to be interesting to the audience, involve in the dialogue, finally, declaring the business of their clients in social media.

3. Journalism of data. The journalist mastered the work with databases and materials of sociological research. A. Rodionov gives an example, expressed in a metaphor: "The orange juice that you drink in the morning, the coffee that you brew – in the modern global economy there are invisible links between these products, other people and you. The language of this network is data: small pieces of information, which often do not matter by themselves, become extremely important when you look at them at the right angle" (Rodionov, 2014). Exciting stories require journalistic intuition and taste. Designers and programmers become co– authors of stories and help create interactive visualization (for example, the German edition of *Zeit,* which offers information about standards of living in different countries, or the magazine Esquire, which analyzes the best– selling works of art).

4. Monetization and Paywall. The reader is not ready to pay money for what he knows. It is necessary to sell information service, as does *Bloomberg* and *Reuters*. It is important for editors to learn how to provide information products, going beyond the boundaries of the usual journalistic materials. The editors offer a new concept of individual customer service, alternative ways of effective interaction with the audience and change the methods of conducting their business in order to provide perspective in a modern competitive environment. The question turns out to be controversial.

The emergence of new information platforms (*Facebook, Instagram, Snapchat*), new forms of news gathering (data journalism), changing expectations of media consumers' preferences, generational features of the audience, demanded that educational institutions train journalists with TEC skills (Technologies, Entrepreneurship Creativity. In the Western and domestic, primarily online media, there are new posts (digital–editor, web–editor, web–contenteditor, information product development manager).

New stage in the development of media education (2000–2018) is associated not only with technological changes, but also with the main media education initiatives of UNESCO and the Council of Europe (Fedorov, Levitskaya, 2018).

When preparing for new educational standards, the developers faced the following dilemma: how to balance between fast reporting and fact checking how to choose between watchdog and facilitator professional roles which ethics rely on – editorial or universal does objectivity matter if subjectivity rules the audience (Nigmatullina, 2018).

4. Results

Therefore, in the near future, we will see the coexistence of publications in paper and electronic formats, but going to the Internet of many printed media will only intensify, there will be more and more mass media, which do not have printed analogues. With the advent of new media, primarily Internet media – forms of systematic and regular dissemination of information through networked multimedia technologies, the communicative behavior of the audience has changed. The importance of the Internet media is determined by the absence of restrictions on the time of placement and the volume of information, as well as modern technical capabilities, the convenience of information retrieval. The network text acts as a way of public intervention in the process of discussing the topic, making a decision. The consequences of the appearance of the network text are not always predictable even for journalists.

5. Conclusion

All of this is a stimulus for the development of the traditional mass media, bringing to life an entirely new group of people influencing public opinion, with a completely different mechanism for collecting and disseminating information, and at the same time changing the daily order of news search.

In order to preserve academic traditions and respond to the challenges of the labor market, an expert council was created for continuous cooperation with employers. It includes well–known St. Petersburg journalists and media managers, whose experience turned out to be in demand by the management of the faculty in planning the educational process. In addition, the educational infrastructure has been updated, new computer classes have opened, the television studio has been digitized, a multimedia news room has been equipped. The faculty purchased software so that students could gain skills in working with modern digital layout technologies, editing, photography.

References

Bennett, Senor, 2017 – *Bennett, M., Senor, J.* (2017). Innovations in News Media. World Report. Innovation Media Consulting Group.

Buren, 2009 – *Buren, K.* (2009). From what point should we start the transition to mobile platforms? *Center of Information Communications*. [Electronic resource]. URL: http://www.commcenter.ru/mmedia/articles/2009_02_23.html

Dubinin, 2016 – *Dubinin, V.* (2016). Are mobile publications still a future or present? Interview with Vitally Dubinin. [Electronic resource]. URL: http://www.pvsm.ru/news /14533/print.

Erhel, Jamet, 2019 – *Erhel, S. Jamet, E.* (2019). Improving instructions in educational computer games: Exploring the relations between goal specificity, flow experience and learning outcomes. *Computers in Human Behavior,* 91: 106–114.

Fedorov, Levitskaya, 2018 – *Fedorov, A., Levitskaya, A.* (2018). Comparative analysis of the development of mass media education in the Commonwealth of Independent States (CIS) countries. *Media Education*, 58 (3): 39–62. DOI: 10.13187/me.2018.3.39

Fuchs, Qiu, 2016 – *Fuchs, C., Qiu, J.L.* (2016). Ferments in the Field: Introductory Reflections on the Past, Present and Future of Communication Studies, *Journal of Communication,* 6 (2): 219–232.

Gebremariam et al., 2018 – *Gebremariam, M., Gheorghita, G., Tor–Morten, G., Wu–Yuin, H.* (2018). Enhanced Agility of E–Learning Adoption in High Schools. *Journal of Educational Technology & Society,* 21 (4): 157–170.

Gikas, Grant, 2013 – *Gikas, J, Grant, M.* (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones & social media. *The Internet and Higher Education*, 19: 18–26.

Grothaus, 2017 – *Grothaus, M.* (2017). *This is how the way you read impacts your memory and productivity*. [Electronic resource]. URL: https://www.fastcompany.com/40476984/this– is–how– the– way– you– read– impacts– your– memory– and– productivity.

Li, 2016 – *Li, C.* (2016). Mobile Internet – a new lifestyle, creating an information society of the future. *Library of the Internet Industry I2R.ru*. [Electronic resource]. URL: http://www.i2r.ru/static/340/out_9965.shtml.

Lozada–Martínez et al., 2018 – *Lozada–Martínez, E., Fernández–Peña, F., Urrutia–Urrutia, P.* (2018). Sophomore Students' Acceptance of Social Media for Managing Georeferenced Data in a Socially– Enhanced Collaborative Learning Process, *Information and Communication Technologies of Ecuador (TIC.EC):* 229– 224.

Lozada–Martínez et al., 2018 – *Lozada–Martínez, E, Fernández–Peña, F, Urrutia–Urrutia, P.* (2018). Sophomore Students' Acceptance of Social Media for Managing Georeferenced Data in a Socially–Enhanced Collaborative Learning Process. *Conference on Information Technologies and Communication of Ecuador TICEC 2018: Information and Communication Technologies of Ecuador (TIC.EC)*: 329–344.

Mangen et al., 2013 – *Mangen, A., Walgermo, B.R., Bronnick, K.R.* (2013). Reading linear texts on paper versus computer screen: Effects on reading comprehension. *International Journal of Educational Research*, 58:61-68.

Moskvina, 2012 – *Moskvina, O.* (2012). *Mobile newspapers as a segment of the media system in Western Europe. Ph.D. Dis.* [Electronic resource]. URL: http://cheloveknauka.com/mobilnye–gazety–kak–segment–sistemy–smi–stran–zapadnoy–evropy

Myasnikov, 2017 – *Myasnikov, I.* (2017). "Faculty of Journalism 2030": Is the Impossible Possible? Strategic sessions on professional education at the Faculty of Journalism of Tomsk State University, 2: 124–129.

Newman, 2017 – *Newman, N.* (2017). Journalism, Media and Technology Trends and Predictions. Reuters Institute for the Study of Journalism, 52 p.

Nigmatullina, 2018 – *Nigmatullina, K.R.* (2018). Professionalism in the digital age of journalism. *Digital transformation of mass media: regional national and global aspects*. Moscow: 80–81. [Electronic resource]. URL: www.opera.com

Philo, 2012 – *Philo, F.* (2012). *Monetization of the mobile web: lost illusions*. [Electronic resource]. URL: http://alexschneider.ru/translation/monetizaciya–mobilnogo–veb–trafika–utrachennyeillyuzii

Pogorely, 2015 – *Pogorely, Y.* (2015). Brands against fakes. *Mobilizing the audience.* [Electronic resource]. URL: http://www.unkniga.ru/vistavki–konferents/4513–kontent–v–internete–era–mobilnogopotrebleniya.html

Pronin, 2002 – *Pronin, E.I.* (2002). Psychological problems of modern journalism. Problems of media psychology, 320 p.

Rodionov, 2014 – *Rodionov, A.* (2014). Five trends of modern journalism – they can not be ignored. [Electronic resource]. URL: http://www.e–xecutive.ru/management/marketing /1920987–pyat–trendov–sovremennoi–zhurnalistiki–ih–uzhe–nelzya–ignorirovat

Sara's, 2008 – *Sara's, L.* (2008). The story of Facebook, YouTube@MySpace: The people, ehe hype and the deals behind the giants of Web 2.0. Gotham Books, 304.

Usmanov, 2015 – *Usmanov, A.* (2015). Mobilization of the audience. [Electronic resource]. URL: http://www.unkniga.ru/vistavkikonferents/4513–kontent–v–internete–era–mobilnogopo trebleniya.html

Vrielink et al., 2018 – *Vrielink, R., Nijhuis–Boer, V., Horne, C., Hans, E., Hillegersberg, J.* (2018). A Framework for Planning and Control of the Education Organization, *Smart Education and e– Learning 2018 KES SEEL– 18:* 234–245.