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New Media Literacy Skills of Youth in Zadar

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SUMMARY

The emergence of new media has caused changes in peoples' communication behaviours. Despite their potential, there is a lack of empirical data on the ways they have been used. This paper presents the findings of a study conducted in 2014 on new media literacy of youth enrolled in secondary schools in Zadar. The purpose of the study was to assess youth's media exposure, engagement in Web 2.0 services and new media literacy skills. The theoretical framework is a concept of twelve new media literacy skills developed by H. Jenkins (2006). These skills are: play, appropriation, distributed cognition, collective intelligence, judgment, transmedia navigation, networking, negotiation, and visualization. The results of the study showed that the most developed new media literacy skills were visualisation, collective intelligence, play and judgement. The one-way analysis of variance confirmed the hypothesis that gender, type of educational program, exposure to media and engagement in Web 2.0 services have significant effects on these skills. Compared with the findings of similar studies, these results represent the starting point in discussing youth's adaptation degree to changes in the public communication in the digital era.

Keywords: New media literacy, skills, youth.

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Introduction

New media have transformed the way society is connected and interacts. The online environment is much more complex, diverse and dynamic than the traditional media sphere. In the past ten years, we have seen the emergence of *Web 2.0* services like *Facebook*, *YouTube*, and *Twitter* that are introducing profound changes in the nature and organisation of contemporary communication: the communicator is no longer in the privileged position as is the case in the traditional mass communication sphere neither is the public a passive consumer of pre-selected and arranged contents according to the criterion of media professionals. The public has the opportunity to comment the information, express opinions and reactions, discuss with their authors, refer them to new sources, similar and different information and thus participate in their creation (Zgrabljić Rotar, 2011: 49).

Social network sites, online games and video-sharing sites are now well-established fixtures of youth culture. Many young people go online to *hang out* with friends they already know from schools and their neighbourhoods. They may *mess around* with programs, tools, and platforms, just to see what they can do. And, they may *geek out* as fans, bloggers, and gamers, digging deep into an area of intense interest to them, moving beyond their local community to connect with others who share their passions (Ito, 2009). Each of these modes encourages young people to master core technical competencies, but they may also strengthen social bonds, create shared experiences, encourage conversations, and provide a starting point for other civic activities (Jenkins, 2009).

The explosion of youth subscription to content media sharing sites confirms their relevance and importance in the lives of today's youth. The time young people spend engaging with these new forms of cultural experience fosters real benefits in terms of their mastering of core social skills and cultural competencies (or *new media literacies*) they are going to be deploying for years to come. In the period of print dominance, literacy meant simply writing and reading. With the development of electronic media, in particular with the emergence of television, the concept of literacy has expanded on the ability of the public to receive, decode and interpret audio-visual messages. In this new media age, related to Internet and *Web 2.0*, people need *new* kinds of *skills* and *new knowledge* constantly to become new media literate in order to participate responsibly in the new century society (Chen et al., 2011).

Theoretical background

Content-sharing web sites combine media production and distribution with social networking features, making them an ideal place to create, connect, collaborate, and circulate novel and personally meaningful media. However, much of new media centres on the tools and technology of what may or may not be possible. The interaction these media allow is important, but the interactivity is merely a property of the technology. Convergence of communication and content on the latest iteration of the Web is about culture more than technology. By merging the technical aspects of youth as media creators with the social aspects of youth as social networkers, new media platforms offer a participatory culture in which youth can develop, interact, and learn. The technology itself only provides the potential for participation, though the outcome is dependent on the user. Participatory culture is emerging as the culture absorbs and responds to the explosion of new media technologies that make it possible for average consumers to archive, annotate, appropriate, and re-circulate media content in powerful new ways (Jenkins et al., 2009: 8). Though the user is principally empowered to shift from the role of a passive consumer to the role of an active producer, this step must be accompanied by the development of new skills in order to strengthen participation.

Following Jenkins et al. (2009), participatory culture can be defined as a culture with relatively low barriers to artistic expression and civic engagement, with strong support for sharing one's creations with others, and with some type of informal mentorship whereby knowledge is being passed from experienced to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another. From this, it is clear that a defining feature of participatory culture is the level of social involvement and interaction. Participatory culture shifts the focus of literacy from one of individual expression to community involvement. People participate in the creation and circulation of media content within social networks that extend from their circle of face-to-face friends to a larger virtual community around the world. Through creating and sharing content, social bonds are often formed, and as a corollary, various types of online communities. As such, Jenkins groups participatory culture into four categories: affiliations (memberships, formal and informal, in online communities centred around various forms of media, such as *Facebook* or *MySpace*), expressions (producing new creative forms, such as digital sampling, fan video making, zines, mash-ups), collaborative problem solving (working together in teams, formal and informal, to complete tasks and develop new knowledge such as through *Wikipedia*, alternative reality gaming, spoiling), and circulations (shaping the flow of media, such as podcasting and blog-

ging). These categories are largely intertwined and mutually dependent, and coalesce to form the foundation upon which participatory culture has been able to thrive.

Media literacy typically has been associated with critical analysis of news, advertising and mass media entertainment. Traditional media literacy consisted of the basic tools needed to read and understand mediated messages. It urges people to ask questions about the media that enters their homes: who created the message, what techniques were used to deliver the message, what values are represented by the media presentation, how might different people understand the message and why is this message being sent? But that is where it stops. These questions focus attention on the contexts within which these messages were created, the goals they served and agendas they promoted, and their impact on receivers. This tradition understands that different people might understand the message in different terms but there was no assumption that people might be able to remix and transform the content to serve their own interests (Reilly and Robison, 2008: 97).

With the emerging new media technologies, traditional literacy is no longer sufficient for an individual to competently survive and to be able to fully engage in the new media environment. New media literacy (NML) is associated with the ability to use computers, social media, and the Internet (Hobbs, 2010). The emphasis is not just on how people respond to media messages, but also on how they engage proactively in a media world where production, participation, social group formation, and high levels of nonprofessional expertise are prevalent (Gee, 2010: 36). Media literacy should not only teaches people to learn from media, to resist media manipulation, and to use media materials in constructive ways, but should also be concerned with developing skills that will help create good citizens and that will make them more motivated and competent participants in social life (Kellner, 2002: 93). Contributing to the concept of new media literacy, Jenkins and his colleagues (2009) identified twelve new media literacy skills that are necessary for a full participation in today's media environment:

- *Play* - the capacity to experiment with one's surroundings as a form of problem-solving,
- *Performance* - the ability to adopt alternative identities for the purpose of improvisation and discovery,
- *Simulation* - the ability to interpret and construct dynamic models of real-world processes,
- *Appropriation* - the ability to meaningfully sample and remix media content,
- *Multitasking* - the ability to scan one's environment and shift focus as needed to salient details,

- *Distributed cognition* - the ability to interact meaningfully with tools that expand mental capacities,
- *Collective intelligence* - the ability to pool knowledge and compare notes with others toward a common goal,
- *Judgment* - the ability to evaluate the reliability and credibility of different information sources,
- *Transmedia navigation* - the ability to follow the flow of stories and information across multiple modalities,
- *Networking* - the ability to search for, synthesize, and disseminate information,
- *Negotiation* - the ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms and
- *Visualization* - the ability to interpret and create data representations for the purposes of expressing ideas, finding patterns, and identifying trends.

A recent research in Croatia pointed out that 81 % of Croatian young people access the internet via a PC or laptop and 77% from their mobile phones, on a daily basis (Gospodnetić and Morić, 2013). Although the Internet usage of youth is high, it is not enough to assume that they are *digital natives*. New media are not automatically learned. New media literacy education should be a process of teaching and learning about new media. However, media literacy is not a part of the school curriculum in Croatia. Therefore, the purpose of the study was to assess youth new media literacy skills based on Jenkins' twelve new media literacy skills in the Croatian context. Toward this purpose, the following research questions were investigated: (a) what are the new media literacy skills levels of Croatian youth? (b) Are there any characteristic significant differences in participants' new media literacy skills scores with regard to age, gender, type of education and place of residence? (c) Are there any significant differences in participants' new media literacy skills scores and their media exposure? (d) Are there any significant differences in participants' new media literacy skills scores and their engagement in Web 2.0 services?

Methods

Data collection was carried out during January and February 2014. The survey was administrated to 2nd, 3rd and 4th grade male and female students at three public secondary schools in the Zadar area. Three hundred twenty-one surveys were distributed in the classroom setting. On the first page of the instrument, respondents were informed that participation is completely voluntary, that they may withdraw at any time, and the answers would be anonymous. Of the 321 students who started the

survey, 11 students did not complete all the sections of the survey, so their scores were excluded from the analysis. The remaining data was then analysed using IBM SPSS 19 statistics software. In order to analyse data toward the research questions, both descriptive and inferential (ANOVA) statistical techniques were used.

The questionnaire consisted of three different sections: (a) demographics (gender, age, educational program, and place of residence) (b) questions related to media exposure and engagement in Web 2.0 services and, (c) questions that measured new media literacy skills. The media use characteristics section queried participants about the number of hours per day they spend with the Internet, television, radio and video games (media exposure), and the number of hours per day they spend on activities on social networking sites, i.e. *Facebook*, *YouTube*, *Twitter*, etc., blogging and podcasting (engagement with specific Web 2.0 services). The third section of the questionnaire aimed to assess participants' new media literacy skills through 60 statements, originally developed by Literat (2014). The statements were translated into Croatian by the first author of this paper and a Croatian English-teacher. There were five statements for each skill, making a total of 60 items. The items were answered based on a 5-point scale. A pilot test of the survey instrument was conducted across a sample of 12 respondents from the same population to ensure that questions were easy to understand and answer, and clear in conveying meaning. The overall Cronbach's Alpha reliability coefficient for the entire scale was calculated to be 0.89.

Table 1 Participants' demographic information

Tablica 1. Demografska obilježja ispitanika

		N	%	N	%	N	%	N	%
Gender:	female	209	67,40						
	male	101	32,60						
Age:	16			21	6,80				
	17			89	28,70				
	18			129	41,60				
	19			67	21,60				
	20			4	1,30				
Educational programs:	3-years vocational					54	17,40		
	4-years vocational					188	60,60		
	gymnasiums					68	21,90		
Place of residence:	rural							123	39,70
	urban							187	60,30

A total of 310 valid *questionnaires* were collected. With regard to age 41.6% of participants were 18 years old; 28.7% were 17; 6.8% of participants were 16 and 22.9% were from the ages over 19. In terms of gender, 67.4% of the participants were female and 32.6% were male. With regard to the type of educational program, 21.09% were enrolled in **gymnasiums programs**, 60.6% were enrolled in four years **vocational programs** and 17.4 % in three years **vocational programs**. The largest number of respondents (60.3%) reported living in urban areas, while 39.7% were from rural areas¹. The participants' demographic data are provided in table 1.

Results

We first looked at respondents media exposure, which included time spent with four forms of media: Internet, television, radio, and video games. The results are presented in table 2.

Table 2 Youth's media exposure
Tablica 2. Medijska izloženost mladih

		Time (daily)								Total
		none	less than 30 min	30 min to 1 hr	1 to 2 hr	2 to 3 hr	3 to 4 hr	4 to 5 hr	over 5 hr	
Internet	n	0	15	37	84	54	45	17	58	310
	(%)	0.00%	4.80%	11.90%	27.10%	17.40%	14.50%	5.50%	18.70%	100%
TV	n	23	47	65	86	50	24	8	7	310
	(%)	7.40%	15.20%	21.00%	27.70%	16.10%	7.70%	2.60%	2.30%	100%
Radio	n	131	91	34	26	11	6	3	8	310
	(%)	42.30%	29.40%	11.00%	8.40%	3.50%	1.90%	1.00%	2.60%	100%
Video games	n	102	89	52	31	12	8	8	8	310
	(%)	32.90%	28.70%	16.80%	10.00%	3.90%	2.60%	2.60%	2.60%	100%

Of the 310 study participants, 56% of them spent more than 2 hours a day on the Internet, 27% from 1 to 2 hours and 17% up to an hour. Although most respondents (93%) reported watching television every day, just 29% of them spent more than 2 hours watching it, 28% spent 1 to 2 hours and 36% an hour or less. Seven percent reported not to watch TV at all. While 58% of the respondents listened to radio daily, 29 per cent respondents said they listened to radio less than half an hour and 19% from 30 minutes to 2 hours. About one-quarter of the *respondents claimed not to play video games at all*. Alternatively, *approximately 28%* said they spent

playing games under 30 minutes daily, followed by 17% between 30 minutes to 1 hour and 11% over 2 hours. It is obvious, that a vast majority of the participants in this study were spending a great deal of time focusing on media daily.

Next, the respondents were asked how often they participate in various *Web 2.0* services daily. The results are presented in Table 3. The majority of respondents used *Facebook* (95.20%). When looking at the respondents' time spent on *Facebook*, the results show that 35.20% ($n=109$) spent an hour or less in the activity, 22.90% ($n=71$) reported spending 1-2 hours, 12.30% ($n=38$) 2-3 hours and 12.60% ($n=39$) over five hours. Fifteen participants (4.80%) reported spending zero minutes on *Facebook*.

Table 3 Engagement in various Web 2.0 platforms
 Tablica 3. Učešće u različite Web 2.0 platforme

		Time (daily)								Total
		none	less than 30 min.	30 min to 1 hr	1 to 2 hr	2 to 3 hr	3 to 4 hr	4 to 5 hr	over 5 hr	
Facebook	n	15	58	51	71	38	21	17	39	310
	(%)	4.80%	18.70%	16.50%	22.90%	12.30%	6.80%	5.50%	12.60%	100%
Twitter	n	277	17	7	4	3	1	0	1	310
	(%)	89.40%	5.50%	2.30%	1.30%	1.00%	0.30%	0.00%	0.30%	100%
Youtube	n	18	64	84	65	37	15	15	12	310
	(%)	5.80%	20.60%	27.10%	21.00%	11.90%	4.80%	4.80%	3.90%	100%
Blogging	n	284	10	6	2	3	0	3	2	310
	(%)	91.60%	3.20%	1.90%	0.60%	1.00%	0.00%	1.00%	0.60%	100%
Podcasting	n	294	10	2	1	0	0	1	2	310
	(%)	94.80%	3.20%	0.60%	0.30%	0.00%	0.00%	0.30%	0.60%	100%
Other Web2.0 services	n	142	91	37	26	4	3	2	5	310
	(%)	45.80%	29.40%	11.90%	8.40%	1.30%	1.00%	0.60%	1.60%	100%

Following *Facebook* was *Youtube* (94.20%) with a very similar time-spent distribution to that of *Facebook*. Relatively few respondents reported participating in *Twitter* activities (10.60%), blogging (9.40%) and podcasting (5.20%). However, it is interesting to note that 168 (54.20%) participants reported participating on other Web2.0 services as *Instagram*, *Flickr* and *Tumblr*, with the more users ($n=91$, 54.16%) in the lowest amounts of time spending in this activity.

A descriptive statistics of the new media skills is presented in table 4. The measures of central tendency and variation are presented, in a decreasing order of mean values. The means vary between 2.73 and 3.79. The overall mean of NML skills scores was 3.38 ($SD=0.72$). In particular, the most developed NML skills of youth were visualisation ($M=3.79$, $SD=0.72$), collective intelligence ($M=3.75$, $SD=0.73$), play ($M=3.70$, $SD=0.72$) and judgement ($M=3.69$, $SD=0.71$). The lowest score was appropriation score ($M=2.73$, $SD=0.84$). Performance score of participants was also lower ($M=2.74$, $SD=0.65$).

Table 4 Descriptive statistics of the new media literacy skills scale

Tablica 4. Deskriptivna statistika skale vještina novomedijske pismenosti

Skills	N	X	SD	Minimum	Maximum
Visualisation	310	3.79	0.72	1.00	5.00
Collective intelligence	310	3.75	0.73	1.00	5.00
Play	310	3.70	0.72	1.00	5.00
Judgement	310	3.69	0.71	1.00	5.00
Multitasking	310	3.63	0.71	1.00	5.00
Negotiation	310	3.59	0.78	1.60	5.00
Transmedia navigation	310	3.55	0.74	1.00	5.00
Distributed cognition	310	3.27	0.67	1.20	5.00
Simulation	310	3.14	0.78	1.40	5.00
Networking	310	2.96	0.77	1.00	5.00
Performance	310	2.74	0.64	1.00	4.80
Appropriation	310	2.73	0.65	1.00	4.60
TOTAL NML skills	310	3.38	0.72 (1.21)	1.81	4.24

To explore the relationships between the new media literacy skills and patterns of media exposure and engagement in Web 2.0 services, we ran a series of ANOVAs and post hoc tests. An analysis of variance (ANOVA) testing the effect of participants' demographics on new media literacy skills was run, too.

The results in table 5 expressed as F-ratios and their associated significance show that NML skills of male and female respondents differed to a significant extent in the areas of performance ($F(1,308)=13.068$, $p<0.05$), appropriation ($F(1,308)=4.198$, $p<0.05$), collective intelligence ($F(1,308)=14.931$, $p<0.05$), visualisation ($F(1,308)=12.613$, $p<0.05$) and multitasking ($F(1,308)=12.693$, $p<0.05$). Female participants were significantly higher than male on measures of multitasking (female: $M=3.73$, $SD=0.69$; male: $M=3.43$, $SD=0.71$), collective intelligence (female: $M=3.86$, $SD=0.71$, male:

M=3.52, SD=0.73) and visualisation (female: $M=3.89$, $SD=0.769$ male: $M=3.59$ $SD=0.76$). Males were higher than females on measures of performance (male: $M=2.92$, $SD=0.63$; female: $M=2.65$, $SD=0.63$) and appropriation (male: $M=2.85$, $SD=0.66$; female: $M=2.68$, $SD=0.63$). Educational programs also emerged as having a significant relation to multitasking ($F(2,306)=7.469$, $p<0.05$), visualisation ($F(2,306)=8.2949$, $p<0.05$), play ($F(2, 114,09)=3.680$, $p<0.05$) and collective intelligence ($F(2,306)=6.213$, $p<0.05$). Post hoc comparisons using the Tukey HSD tests ($p<0.05$) indicated that respondents *enrolled in* 4-year vocational ($M=3.69$, $SD=0.68$) and gymnasium ($M=3.73$, $SD=0.62$) programs significantly had higher multitasking and visualisation scores than students *enrolled in* 3-year vocational programs ($M=3.30$, $SD=0.82$). Further, students *enrolled in* 4-year vocational ($M=3.90$, $SD=0.67$) and gymnasium ($M=3.86$, $SD=0.63$) programs proved to be better at visualisation than 3-year vocational program's students ($M=3.35$, $SD=0.84$). Gymnasium students ($M=3.84$, $SD=0.59$) scored higher on collective intelligence than 3-year vocational program's student ($M=3.37$, $SD=0.76$). Games-Howell *post hoc* analyses ($p<0.05$) indicated that 4-year vocational school students ($M=3.78$, $SD=0.69$) significantly scored higher on play than 3-year vocational program students ($M=3.44$, $SD=0.89$). Contrary to our expectation, age and place of residence did not make a significant difference in skills.

Table 5 ANOVA results for differences in NML skills based on demographics
 Tablica 5. Rezultati ANOVA-e za značajnost razlika u vještina novomedijske pismenosti u odnosu na demografska obilježja ispitanika

	Age		Gender		Educational program		Place of residence	
	F	Post hoc	F	Post hoc	F	Post hoc	F	Post hoc
Networking	0,950		0,154		0,572		0,056	
	(p=0,436)		(p=0,695)		(p=0,565)		(p=0,813)	
Play	1,153		1,217		3,680**	1 >2 ^G	1,344	
	(p=0,332)		(p=2,710)		(p=,028*)		(p=0,247)	
Simulation	0,606		2,779		1,516		2,651	
	(p=0,658)		(p=0,097)		(p=0,221)		(p=0,104)	
Performance	1,049		13,068		0,435		3,563	
	(p=0,382)		(p=0,000*)		(p=0,648)		(p=0,060)	
Appropriation	2,105		4,918		1,810*		2,318	
	(p=0,080)		(p=0,027*)		(p=0,168)		(p=0,129)	

Distributed Cognition	1,814		3,623		2,738		0,490	
	(p=0,126)		(p=0,058)		(p=0,660)		(p=0,485)	
Multitasking	0,794**		12,693		7,469	1 > 2 ^T	0,253	
	(p=0,541)		(p=0,000*)		(p=0,001)*	3 > 2 ^T	(p=0,616)	
Collective Intelligence	1,147**		14,931		8,949	3 > 2 ^T	0,090**	
	(p=0,363)		(p=0,000*)		(p=0,000)*		(p=0,765)	
Judgement	1,428		0,728		2,670**		0,565	
	(p=0,225)		(p=0,394)		(p=0,740)		(p=0,453)	
Transmedia Navigation	0,088		0,219		2,494		0,094	
	(p=0,986)		(p=0,640)		(p=0,084)		(p=0,760)	
Negotiation	2,303		0,401		1,237		0,395	
	(p=0,059)		(p=0,527)		(p=0,292)		(p=0,530)	
Visualisation	0,913		12,613		13,268	1 > 2 ^T	0,050	
	(p=0,457)		(p=0,000*)		(p=0,000*)	3 > 2 ^T	(p=0,530)	
	1. 16 y.; 2. 17 y.; 3. 18 y.; 4. 19 y. 5. 20 y.		1. female 2. male		1. 4-year vocational 2. 3-year vocational 3. gymnasium		1. rural 2. urban	
* significant at the 0,05 level; **Welch Anova; ^T Tukey HSD, ^c Games Howell								

A second one-way ANOVA test was done to examine whether or not significant main effects were in participants' NML skills toward their media exposure. The results in table 6 show significant differences among respondents of different Internet exposure levels in their network ($F(6, 303) = 3.989, p < 0.05$), simulation ($F(6, 303) = 2.208, p < 0.05$) and performance ($F(3, 303) = 2.614, p < 0.05$.) skills. Post hoc analyses indicated that respondents who spent 3-4 hours on Internet ($M=3.18, SD=0.78$) had significantly higher network scores than those who spent 1-2 hours ($M=2.68, SD=0.72$). Further, those spending over 5 hours ($M=3.23, SD=0.71$) had higher network scores than those spending 1-2 hours ($M=2.68, SD=0.76$). Also, Tukey HSD tests indicated that respondents spending 3-4 hours on Internet ($M=3.26, SD=0.83$) had higher simulation scores than those spending 1-2 hours ($M=2.91, SD=0.77$). Finally, respondents spending 3-4 hours on Internet ($M=2.85, SD=0.60$) had higher scores than those spending 1-2 hours ($M=2.91, SD=0.77$) on performance.

Table 6 ANOVA results for differences in NML skills based on media exposure
 Tablica 6. Rezultati ANOVA-e za značajnost razlika u razvoju vještina novomedijske pismenosti u odnosu na medijske izloženosti.

	Internet		Television		Radio		Video games	
	F	Post hoc	F	Post hoc	F	Post hoc	F	Post hoc
Network	3,989	5>3 ^T	0,915		0,881		0,947	
	(p=0,001)*	7>3 ^T	(p=0,495)		(p=0,522)		(p=0,470)	
Play	0,631		0,546		0,444**		1,642	
	(p=0,705)		(p=0,799)		(p=0,863)		(p=0,123)	
Simulation	2,208	5>3 ^T	2,077	1>4 ^T	0,874		4,109	3>0 ^T
	(p=0,042)*		(p=0,046)*	1>5 ^T	(p=0,527)		(p=0,000)*	1>0 ^T , 2>0 ^T
Performance	2,614	5>3 ^T	0,689		0,540		4,512	3>0 ^T , 4>0 ^T
	(p=0,017)*		(p=0,681)		(p=0,804)		(p=0,000)*	7>0 ^T , 7>1 ^T
Appropriation	1,394**		0,898		1,088		1,695	
	(p=0,227)		(p=0,508)		(p=0,371)		(p=0,110)	
Distributed Cognition	0,697		1,101		1,645		1,888**	
	(p=0,652)		(p=0,362)		(p=0,122)		(p=0,098)	
Multitasking	1,315		1,788		0,405		0,747	
	(p=0,250)		(p=0,089)		(p=0,899)		(p=0,632)	
Collective Intelligence	0,985		0,670		2,186		1,414	
	(p=0,435)		(p=0,697)		(p=0,035)*		(p=0,199)	
Judgement	1,288		0,776		1,472		2,020	
	(p=0,262)		(p=0,608)		(p=0,177)		(p=0,052)	
Transmedia Navigation	1,330		1,006		1,184		2,889	3>0 ^T
	(p=0,243)		(p=0,427)		(p=0,312)		(p=0,006)*	
Negotiation	1,280		0,301		0,365		1,673	
	(p=0,266)		(p=0,953)		(p=0,922)		(p=0,115)	
Visualisation	1,410		0,576		1,001		0,452	
	(p=0,210)		(p=0,775)		(p=0,430)		(p=0,869)	

1= less than 30 min; 2=0,30 min do 1 hr; 3=1-2 hr; 4=2-3 hr; 5=3-4 hr; 6=4-5 h; 7= over 5 hr; 0 =none
 * significant at the 0,05 level; **Welch Anova; ^TTukey HSD, ^GGames Howell

In terms of time spent on watching television there was a significant difference between respondents in the domain of simulation ($F(7, 302)= 2.007, p<0.05$), with respondents who spent 2-3 ($M=3.36, SD=0.0.63$) and 3-4 hours ($M=3.48, SD=0.89$) scoring higher than respondents who spent less than 30 minutes watching television ($M=2.90, SD=0.79$). The next independent variable we examined was time spent listening radio. The test failed to reveal any statistical differences between the mean scores of respondents.

For video games, the NML skills of the respondents differed to a significant extent in the area of simulation ($F(7, 302)= 4.109, p<0.05$), performance ($F(7, 302)= 4.512, p<0.05$) and transmedia navigation ($F(7, 302)= 2.889, p<0.05$). Post-hoc analyses indicated that participants who played video games less than 30 minutes ($M=3.19, SD=0.75$), from 30 minutes to 1 hour ($M=3.24, SD=0.82$) and 1 to 2 hours ($M=3.49, SD=0.74$) a day, significantly had higher simulation scores than those who did not play games ($M=2.85, SD=0.71$). Further, participants who played video games 1 - 2 hours ($M=3.49, SD=0.74$) and 2 - 3 hours ($M=3.27, SD=0.56$) also had significantly higher performance scores on simulation than those who did not play games ($M=2.85, SD=0.71$). The analysis also revealed that those who played games over 5 hours ($M=3.38, SD=0.57$) significantly scored higher on performance than those who did not play games ($M=2.59, SD=0.57$) or played less than half an hour a day ($M=2.67, SD=0.62$). Finally, post hoc analyses showed that participants who played video games from 1 to 2 hours a day ($M=3.89, SD=0.65$) significantly had higher transmedia navigation scores than who did not play games ($M=3.34, SD=0.74$).

In order to see if there was any difference among respondents in NML skills, depending on the intensity of engagement with Web2.0 services we ran a one-way ANOVA. For the purpose of facilitating the analysis, respondents were re-categorized to 5 categories, merging the categories 2-3 hr, 3-4 hr, 4-5 hr and over 5 hr into a single category: over 2 hours. As shown in table 7, the results were significant across all Web 2.0 platforms, except in the case of podcasting.

A significant difference in NML skills between *Facebook* users was found in the domain of network ($F(4, 305)= 4.304, p<0.05$). Participants who spent over 2 hours ($M=3.21, SD=0.74$) daily on *Facebook* scored higher than those who spent less than an hour ($M=2.67, SD=0.73$) and non-users of *Facebook* ($M=2.43, SD=0.57$). *Twitter* users significantly differed in 5 NML skills: simulation ($F(4, 305)= 3.425, p<0.05$), appropriation ($F(4, 305)= 2.926, p<0.05$), distributed cognition ($F(4, 305)= 2.499, p<0.05$), transmedia navigation ($F(4, 305)= 2.794, p<0.05$) and negotiation ($F(4, 305)= 3.229, p<0.05$). Post hoc analyses indicated that respondents who spent 1-2 hours ($M=3.60, SD=0.43$) on *Twitter* scored higher on appropriation than *Twitter*

Table 7 One-way ANOVA results for differences in NML skills based on respondents engagement with Web 2.0 services

Tablica 7 Rezultati ANOVA-e za značajnost razlika u vještinama novomedijske pismenosti u odnosu na učesće ispitanika u Web 2.0 aplikacijama vještine

	Facebook		Twitter		Youtube		Blogging		Podcasting		Other (tumblr, Instagram, Flickr,...)	
	F	Post hoc	F	Post hoc	F	Post hoc	F	Post hoc	F	Post hoc	F	Post hoc
Network	7,430 (p=0,000)*	4>1 ^T 4>0 ^T	2,360 (p=0,053)		4,059 (p=0,003)*	4>1 ^T	3,267 (p=0,012)*		0,882 (p=0,475)		3,651 (p=0,006)*	3>0 ^a
Play	0,274 (p=0,895)		2,315 (p=0,057)		0,827 (p=0,509)		0,937 (p=0,443)		0,775 (p=0,542)		1,744 (p=0,140)	
Simulation	0,711 (p=0,585)		3,425 (p=0,009)*		1,865 (p=0,116)		2,023 (p=0,091)		0,865 (p=0,485)		1,86 (p=0,117)	
Performance	1,453 (p=0,216)		2,344 (p=0,055)		2,736 (p=0,029)*		2,627 (p=0,035)*		0,06 (p=0,993)		1,35 (p=0,251)	
Appropriation	1,013 (p=0,401)		2,926 (p=0,021)*	3>0 ^T	0,662 (p=0,619)		2,373 (p=0,052)		0,976 (p=0,421)		1,544 (p=0,189)	
Distributed Cognition	0,896 (p=0,467)		2,499 (p=0,043)*	1>0 ^T	0,629** (p=0,643)		0,497 (p=0,738)		0,235 (p=0,918)		0,725 (p=0,576)	
Multitasking	0,644 (p=0,631)		1,546 (p=0,189)		3,113 (p=0,016)*	4>1 ^T	1,323 (p=0,261)		0,857 (p=0,490)		2,397 (p=0,050)*	2>0 ^T
Collective Intelligence	0,246 (p=0,912)		2,377 (p=0,052)		1,116 (p=0,349)		1,709 (p=0,148)		0,289 (p=0,885)		1,342* (p=0,265)	
Judgement	0,733 (p=0,570)		0,810 (p=0,519)		0,281 (p=0,890)		2,286 (p=0,060)		1,087 (p=0,363)		0,483 (p=0,749)	
Transmedia Navigation	0,151 (p=0,962)		2,794 (p=0,026)*	1>0 ^T	3,222 (p=0,013)*	3>0 ^T	1,864 (p=0,117)		0,561 (p=0,691)		3,524* (p=0,012)*	2>0 ^G
Negotiation	0,662 (p=0,620)		3,229 (p=0,013)*		0,805** (p=0,525)	4>0 ^T	2,356 (p=0,054)		1,328 (p=0,259)		1,859 (p=0,118)	
visualisation	0,477 (p=0,752)		0,535 (p=0,710)		0,701 (p=0,592)		1,882 (p=0,113)		2,126 (p=0,077)		1,271 (p=0,281)	

1= less than 30 min; 2=0,30 min do 1 hr; 3=1-2 hr; 4=over2 hr; 0 =none; a= never (or rarely); b= once a month; c= once a week; d= several times a week; e= everyday; * significant at the 0,05 level; ** Welch Anova; ^T Tukey HSD; ^G Games Howell

non-users ($M=2.70$, $SD=0.63$). Next, those who spent less than 30 minutes ($M=4.01$, $SD=0.64$) had higher transmedia navigation scores than those who were not interested in twittering ($M=3.50$, $SD=0.73$). Respondents spending less than 30 minutes ($M=3.71$, $SD=0.62$) on *Twitter* also scored higher on distributed cognition than *Twitter* non-users ($M=3.23$, $SD=0.68$). Post-hoc tests revealed no significant differences in simulation or negotiation scores between individual groups.

Youtube also emerged as having a significant relation to NML skills. The differences between respondents were significant in the areas of network ($F(4, 305)= 4.059$, $p<0.05$), performance ($F(3, 305)= 2.736$, $p<0.05$), multitasking ($F(4, 305)= 3.113$, $p<0.05$) and transmedia navigation ($F(4, 305)= 3.222$, $p<0.05$). Participants that spent over 2 hours ($M=3.18$, $SD=0.67$) a day on *Youtube* scored higher in networking skills than those spending less than 30 min. ($M=2.74$, $SD=0.76$). Further, those spending 2-3 hours a day ($M=3.80$, $SD=0.73$) on *Youtube* also scored higher in multitasking skills than those spending less than 30 min. ($M=3.43$, $SD=0.68$). Non-users of *Youtube* ($M=3.14$, $SD=0.53$) significantly scored lower in transmedia navigation than those spending 1 to 2 ($M=3.70$, $SD=0.67$) and over 2 hours ($M=3.68$, $SD=0.74$) a day on *Youtube*. Blogging emerged as another platform having a significant relation to NML skills. Although differences between respondents were significant in the areas of network ($F(4, 305)= 3.267$, $p<0.05$) and performance ($F(4, 305)= 2.627$, $p<0.05$), post-hoc tests did not revealed significant differences between individual groups. Finally, significant differences were also found among users of other Web 2.0 services (as) in the areas of network ($F(4, 305)= 3.651$, $p<0.05$), multitasking ($F(4, 305)= 2.397$, $p< 0.05$) and transmedia navigation ($F(4, 59,117)= 3.524$, $p<0.05$). Post hoc test revealed that respondents who spent 30 minutes to 1 hour ($M=3.73$, $SD=0.63$) and 1 to 2 hours ($M=3.82$, $SD=0.62$) on other Web 2.0 services scored higher in transmedia navigation skills than non-users of other Web 2.0 services ($M=3.43$, $SD=0.68$). Also, respondents that spent 30 min. to 1 hour ($M=3.89$, $SD=0.57$) on other Web 2.0 services scored higher in multitasking skills than non-users of other Web 2.0 services ($M=3.52$, $SD=0.77$). Finally, those who spent 1-2 hours ($M=3.35$, $SD=0.71$) on other Web 2.0 services scored higher in network skills than non-users ($M=2.81$, $SD=0.79$).

Discussion

The study was designed to explore the connection between new media literacy skills of youth and their degree of media exposure and engagement in Web 2.0 services. The overall mean of NML skills scores of the participants in the present study was mediocre ($M=3.38$). In particular, the most developed NML skills were

visualisation, collective intelligence, play and judgement. The less developed skills were appropriation and performance. The results of this study are consistent with earlier *findings* reported by Balaban-Sali (2012) on a sample of Turkish students of communications, and Andevski and Arsenijević (2013) on Serbian educational and academic community. Visualization ranked in the *top two positions* in all three studies, including ours. Namely, it was on the first place in our study and in Serbia, and on the second in the research in Turkey. Appropriation was found at the bottom of the list in all studies. In the study on Turkish students, as well as in ours, it was the last in the ranking of skills and second to last in the study on Serbian educational and academic community. Performance also was found at the bottom of the list in all studies. It was at the bottom of the list in the case of Serbia (as the *least developed* of all MNL *skills*), and second to last in our study, as well as in the case of Turkish students. This finding could be attributed to the fact that performance and appropriation might have been associated with socially deviant **behaviour**. All the questions measuring performance related to the change of identity (but for the purpose of exploring and learning). On the other hand, as Andevski and Arsenijević (2013) noted, appropriation (the ability of sampling and remixing other sources in one's own work) can have a negative connotation from the *aspect of respect for intellectual property* and therefore it was not rated as a desirable skill (although positively oriented in the context of participatory culture).

The next research question asked whether new media literacy skills differed depending on the demographic characteristics of the respondents. A one-way ANOVA test was used to determine if gender had an influence in participant scores. Results showed that girls scored statistically significantly higher when compared with boys on visualisation, collective intelligence, and multitasking skills than males. Boys were higher than females on measures of performance and appropriation. Similarly, the results also confirm the connection between new media literacy skills and the educational program students were enrolled into. Those *enrolled in 4-year* educational programs (vocational and gymnasiums) displayed higher multitasking and visualisation skills than students *enrolled in 3-year* vocational programs. Further, students *enrolled in 4-year* vocational programs scored higher on play than those *enrolled in 3-year* vocational programs. Finally, students *enrolled in gymnasiums* programs scored higher on collective intelligence than those *enrolled in 3-year* vocational programs. The explanation can be found in the fact that the aim of 3-year vocational education programmes is to qualify students to work in a profession. They are structured as a combination of school instruction and practical training. Subjects that could support the development of NML skills are simply not present or are not held in so many hours as in four-year schools programs, and are limited to

areas that are considered a priority for a given profession. Such orientation ignores students' personal and social development. Contrary to our expectation, age did not make a significant difference in skills. Perhaps the lack of significance can be explained by the fact that students belong to the same generation, which is highly connected to computers and Internet. Although the differences between urban and rural ways of life, there was *no difference found between urban and rural* groups in terms of NML skills

Our analyses show that higher exposure to media predicts an increased level of new media literacy skills. The difference between heavy and light or non-users of new media (internet and video games) was especially observed in the categories of networking, performance, simulation and transmedia navigation. For television, the difference between light and heavy users was especially pronounced in the area of simulation, with light TV users displaying higher simulation skills than heavy users. It can be discussed that more online (and less offline) exposure boost the new media literacy skills of youth. *This finding is in agreement* with Balaban-Sali's (2012) and Literat's (2014) *findings* which showed that individuals who consume new media extensively had the highest NML levels.

An overarching finding from this analysis is that time spent (engagement) with Web 2.0 platforms relate to new media literacy skills. For *Facebook*, the difference was pronounced in the area of networking, with heavy users (spending over 2 hours) displaying higher networking skills than light (spending less than 30 min.) or non-users. This result *is in line with the findings* of Literat (2014). *Twitter* also emerge as a significant platform in terms of new media literacy skills, with the main difference between *Twitter* users and non-users in the area of appropriation, distributed cognition and transmedia navigation. This can be explained by the fact that *Twitter* is a platform for sharing someone else's content (links, tweets, and gems they find from others using the service) and a source of multimedia information (video and photo's). For *Youtube*, the skills where respondents significantly differed were networking, performance, multitasking and transmedia navigation, all in *favour of* those using it one hour or more daily. This is not surprising as *Youtube* has all the elements of a *social networking site*. Also, as Literat (2014: 21) stated, it is a source of multimedia information (encouraging transmedia navigation) and a democratic limelight for personal opinion (performance).

For blogging the NML skills that made the most significant difference between users were networking and performance. However, the detailed analysis of the results (post hoc tests) showed no significant difference, therefore, for a complete answer to the question of whether blogging is important for NML skills, it would be neces-

sary to perform additional analysis. The next analysis explored the connection between podcasting and NML skills. Also consistent with Literat's (2014) research on the US population, we didn't find significant differences in NML skills with respect to the time respondents spent on podcasting. Finally, considering other *Web 2.0* services as *Flickr*, *Instagram* and *Tumblr*, youth showed differences in networking, distributed cognition, transmedia navigation skills in favour of user spending more than 1 hour daily on those platforms. On the other hand, significant differences in NML skills were found between moderate users and non-users of other *Web2.0* platforms in the area of networking, distributed cognition and transmedia navigation, in favour of moderate users.

In order to fully consider the potential of this study, several limitations must be addressed. Findings are based on self-reported measures gathered from a specific city (county) in Croatia, which limits the generalizability of the results. Furthermore, having students fill in the questionnaires at schools might influence their disclosure of information. Finally, the scores represent the level of NML skills at the time of data collection and do not provide information about its development process.

Conclusion

Web 2.0 technologies are blurring the once distinct boundary between media *producers* and *consumers*. In such a world, youth need skills for interacting within a larger community, and not simply an individualized skill to be used for personal expression. New media literacy skills are central to the lives of all young people, who will increasingly communicate and rely upon technology into their adult lives. This paper focused on exploring the new media literacy skills among Croatian high school students and its relationships with their media exposure, and engagement with different *Web 2.0* services and demographic characteristics. The average new media literacy skills assessment score was mediocre (medium), much like in other countries where similar surveys were carried out. The study indicates that NML skills are dependent on gender and the type of educational program. They also suggest that age and place of residence are not related to students' NML skills. *Corroborating prior studies*, we find a positive relationship between media literacy skills levels and students' media exposure levels. Higher exposure to media in general predicts an increased level of new media literacy skills. Finally it is understood that there is a significant difference between students' engagement with *Web2.0* platforms (services), on a daily basis and their new media literacy skills levels.

Mastering new media literacy skills remains a key step in preparing young people to participate fully in the world of tomorrow. Young people need resources and learning principles to acquire new skills and to think critically about their own relationships to the media. Although youth are acquiring some of these skills through their participation in the informal learning communities that surround popular culture, a systemic approach is needed. Intentional learning and practice of these skills will enable all young people to be equal participants within a technology-advanced world. Empirical research on NML skills is still relatively new and much more research is needed to develop strong theoretical basis as well as an effective assessment tool. Hopefully, this study will stimulate further discussion and provide a basis for further research.

ENDNOTES

- ¹ Urban and rural location in this analysis was determined using *The model for the differentiation of urban, rural and semi-urban settlements in the Republic of Croatia* of the Croatian Bureau of Statistics (2011). According to this model, urban settlements in the County of Zadar are the towns of Benkovac, Biograd na moru, Nin, Obrovac, Pag, and Zadar.
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APPENDIX A

Table A1 Descriptive statistics of measured new media literacy skills
Tablica A1. Deskriptivne vrijednosti skale za mjerenje razine razvijenosti NML vještina

Items	M	SD
NETWORKING	2.96	0.77
I often share links on Facebook, Twitter, my blog, etc.	2.71	1.36
I think that reading other people's recommendations on sites like Amazon is useful in helping me make decisions.	2.65	1.37
It is important for me to be able stay in touch with my friends online too, and not only in real life.	3.54	1.23
When I go online, I like to feel like I am part of a community.	3.04	1.24
I like to share my favourite links or creative work on social media sites like Facebook or YouTube or Twitter	2.86	1.38
PLAY	3.70	0.72
When I am faced with a problem, I usually try out a few different ways of solving it before I give up.	4.02	1.06
When I have a new cell phone or electronic device, I like to try out all the buttons to see what they do.	4.24	1.05
When I get stuck trying to solve a problem, I see it as a learning opportunity rather than a personal failure	3.76	1.08
I have taught myself something new on a computer by seeing what happens when I play around with it	3.44	1.15
I enjoy taking things apart and then putting them back together to find out how they work.	3.02	1.36
SIMMULATION	3.14	0.78
I try to put myself in other people's shoes to understand their problems or situations	3.74	1.01
I'd like to participate in a simulation of something I can't experience in real life, like flying a space shuttle or piloting a fighter jet	3.16	1.55
I appreciate simulation games and activities like Second Life, SimCity, The Sims, FIFA, etc.	2.85	1.51
I think about the way in which reality is represented in movies with computer-generated simulation, like Avatar, Sin City, X-Men, etc.	2.64	1.40
It is important to have simulations of dangerous events like earthquakes or safety evacuations, so that people know what to do in a crisis	3.31	1.26
PERFORMANCE	2.74	0.64
Actors learn a lot about life from the roles they play in films and on stage	3.52	1.13
In certain situations, it is necessary to not be yourself.	2.53	1.31

I know what an avatar is	3.76	1.44
I have often taken on a different identity in order to experience something new or to solve a problem (online games, role-playing, ...).	1.81	1.18
I feel I am a different person online than how I act in person.	2.06	1.26
APPROPRIATION	2.73	0.65
I have created something new that incorporates stuff from popular culture, like making a fan video, or a music remix.	2.19	1.27
When doing a creative multimedia project, I don't think it is wrong to take samples from my favourite artists' songs or videos.	3.02	1.20
If I would make a fan video about my favourite celebrity or artist or band, they'd probably be happy if they found out about it.	2.19	1.27
It is important for young people to learn how to use stuff from popular culture in their own creative ways	3.97	0.95
I have incorporated other people's public work to create my own piece of art, like mixing music tracks, or stringing together video clips.	2.29	1.37
DISTRIBUTED COGNITION	3.27	0.67
I have to keep learning from my surroundings in order to become smarter.	3.29	1.31
I'm usually pretty good at knowing what do to do or who to ask if I want to find out more about a specific topic	3.90	0.97
I don't agree that smart people are born smart.	3.22	1.29
I find it important to use tools like spell check, a calculator, encyclopaedia, etc. to help me in my learning or work.	3.35	1.29
My environment plays a big part in how smart I am.	2.60	1.27
MULTITASKING	3.63	0.71
I manage to do my work successfully while doing other things like listening to music or texting.	3.47	1.31
My generation is good at multitasking, i.e. doing several things at once	3.37	1.10
I can usually prevent getting distracted and focus on tasks well when other things are happening around me, like people talking, TV, etc.	3.32	1.25
I don't think anybody should give me a hard time if I feel I can work on several things at once.	3.86	1.04
When I work on my computer, I like to have different applications open in the same time	4.11	1.10
COLLECTIVE INTELLIGENCE	3.75	0.73
I enjoy the collaborative aspect of things like Wikipedia, team games, online fan communities, etc.	3.46	1.11
I enjoy working with others on projects or assignments.	3.56	1.21
I don't think it's a sign of weakness or stupidity to ask a friend or a colleague for help on work assignments or other problems.	3.97	1.25
When I can't solve a problem or find a piece of information, I use the internet to connect with others and find what I am looking for.	3.94	1.14

I think I can learn a lot from my friends.	3.81	1.11
JUDGEMENT	3.69	0.71
I can identify prejudice or bias in media (e.g. racism on certain websites, prejudice against women in song lyrics, etc.).	3.82	1.22
I can effectively determine whether or not the information I find online is correct and reliable.	2.87	1.17
When I search for something online and I get thousands of results, I can effectively decide which ones will be the most useful for me	3.83	1.09
I am able to enter the right words in a search engine to find what I am looking for.	4.05	1.05
When I'm interested in a topic, I gather information from a bunch of different sources (like TV, internet, etc.) to try to get the full picture.	3.89	1.11
TRANSMEDIA NAVIGATION	3.55	0.74
I can imagine the same story being told in different ways, such as through music, acting, writing, drawing, etc.	3.58	1.08
I follow my favourite shows, actors, musicians etc. across different platforms and media (TV, magazines, Facebook, Twitter, etc.).	3.33	1.34
I'm happy that I can learn about my favourite things in different ways (on TV, on the internet, on Facebook, etc.	4.04	1.03
I often visit the websites (either official or fan-created) of my favourite TV shows, bands, etc.	2.89	1.38
If I am curious about something I saw on TV, I will check it out online later.	3.90	1.19
NEGOTIATION	3.59	0.78
I think that using the internet and/or playing videogames makes people more open to other cultures	3.39	1.18
I am happy that I can interact online or on Facebook with people from all over the world.	3.85	1.08
I think the internet offers a very important opportunity to get to know people from different backgrounds and different places.	3.68	1.19
My experience on the internet and/or in videogames has made me more understanding of those different from myself.	3.20	1.24
I have learned something new about another culture from surfing the internet, participating in online communities or forums, etc.	3.82	1.12
VISUALISATION	3.79	0.72
I feel I understand things better when I can think of them visually.	4.05	1.05
I find Google Maps and/or Google Earth to be extremely useful tools.	3.92	1.16
I like the fact that I can see all my friends on my Facebook profile.	3.84	1.14
When I prepare a project for work or school, I like to use as many images, graphs and diagrams as possible.	3.59	1.13
I think I am pretty good at understanding information from images, graphs, diagrams and other visual tools ⁹	3.57	1.07

Novomedijska pismenost mladih u Zadru

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SAŽETAK

Pojavom novih medija došlo je do brojnih promjena u načinu na koje društvo komunicira. Unatoč njihovom znatnom potencijalu, *još uvijek je nedostatan broj empirijskih istraživanja i podataka* o načinu na koji se koriste. U radu se prikazuju rezultati istraživanja o novomedijskoj pismenosti mladih - učenici srednjih škola u Zadru. Cilj istraživanja bio je utvrditi koliko su mladi izloženi medijima, koliko je njihovo učešće u aktivnostima koje nudi *Web 2.0* te razinu njihove pismenosti za nove medije. Teorijski okvir predstavlja H. Jenkinsova (2006) klasifikacija vještina za nove medije: igra, nastup, simulacija, prisvajanje, multitasking, kolektivna inteligencija, prosuđivanje, transmedijalna navigacija, umrežavanje, pregovaranje, distribuirano saznanje i vizualizacija. Rezultati pokazuju da su najizraženije vještine mladih: sposobnost vizualizacije, kolektivne inteligencije, igranja i prosudbe. Provedena analiza varijance potvrdila je naše polazne pretpostavke da spol, obrazovni program, izloženost medijima i učešće u *Web 2.0* aktivnostima imaju utjecaja na te vještine. Dobiveni rezultati su uspoređeni sa rezultatima sličnih istraživanja te predstavljaju polaznu točku u razmatranju prilagođenosti mladih promjenama u javnoj komunikaciji i medijskoj produkciji digitalne ere.

Ključne riječi: novomedijska pismenost, vještine, mladi