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RESEARCH ON EU-28 USE OF ICT FOR CULTURAL PURPOSE

***Abstract.** The current research is based on the connection between two variables: ICT use and Culture. This paper aims to analyse two key factors that are closely linked to culture, namely ICT use for entertainment and ICT use for education, within the 28 countries of the European Union. The research is based on a survey made by Eurostat for the year 2016 for EU-28 countries. The final results were obtained using factor analysis with SPSS 21.0 software. The current research can be considered a starting point for new research in the field of new technology development and its influence of the main areas of the economy.*

Key words: *ICT use, culture, factor analysis, European Union countries, marketing research.*

JEL Classification: C1, F0, M2, M3

1. Introduction

Knowledge society had an important influence on the adoption of the information and communication technologies (ICT) within the countries of the European Union. However, the investment in ICT has been "emphasized as important for technical change and economic growth" (Brynjolfsson and McAfee, 2014; Nelson, 1959; Schumpeter, 1942). On the other hand, knowledge "has paid a key role in adding value to society and helping to create the so called knowledge society" (Navarro et al., 2017)

OECD (2009) gives a definition on ICT through products "intended to fulfil or enable the function of information processing and communications by electronic means, including transmission and display".

This paper aims to analyse two key factors that are closely linked to culture, namely ICT for entertainment and ICT for education, within the 28 countries of the European Union.

The articles is organised on several sections. In the section entitled Literature review we underline the findings from earlier research within the field of

analysis. In section Research methodology, the methodological framework is presented, together with the variables introduced in the analysis. In the Results section, we present the main findings of the research.

2. Literature review

The economic growth of a country “registers irregular evolutions in time, in which the expansion periods follow periods of stagnation” (Cristea et al., 2010) The current economic circumstances of the economic crisis were perceived at the level of all countries in all the economic sectors. (Buşe et al., 2007)

The “reduction in social economic disparities” represents a key element at the level of all European Union countries. (Miron D. et al., 2009) Thus, the development and adoption of the new technology has also been influenced during the recent years.

Several studies emphasized the connection between information and communication technologies (ICT) and research and development (R&D) and value added growth. (Edquist and Henrekson, 2017).

Various authors approach the use of ICT in education (Bilyalova, 2017). Putting in place “regular monitoring information based systems” can ensure quality in higher education. (Nicolescu and Dima, 2010)

The main research question of the current study emphasises the connection between ICT use and culture, mainly based on two main factors (entertainment and education), each one with several representative dimensions.

3. Research methodology

For each of the EU-28 member states, we chose a series of variables as part of the analysis, available on Eurostat Database for the year 2016. (Table 1)

Table 1. Variables for ICT use for cultural purpose

Variables
Seeking health information
Watching internet streamed TV or videos
Watching video on demand from commercial services
Watching video content from sharing services
Watching video content from commercial or sharing services
Finding information about goods and services
Internet banking
Travel and accommodation services
Online learning material
Communication with instructors or students using educational websites/ portals
Any of the learning activities
Watching internet streamed TV (live or catch-up) from TV broadcasters
Managing a payment account to (potentially) pay for goods or services purchased over the internet

Sending/ receiving e-mails
Doing an online course (of any subject)

Source: The authors' own processing data

Caring out a dimension reduction by factor analysis, we intend to define one or more ICT usage indicators for cultural purpose within the European Union member states. The Kaiser-Meyer-Olkin (KMO) test has a value of 0.717, while the significance of the contrast is 0%. (Table 2)

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.717
Bartlett's Test of Sphericity	Approx. Chi-Square	555.046
	df	105
	Sig.	0.000

Source: Data analysis using SPSS 21.00 software

The table of the explained variance presents the two dimensions that resume the information. The first dimension allows us to explain 43.524% of the information of the variation of the phenomenon, in other words the variables that are part of this dimension synthetize 56.476% of the phenomenon. The second dimension explains 25.664% of the total variance. According to Hair et al. (2006), we can stop the process of factor extraction once a percentage of 60% of the cumulated variance was extracted. The cumulated variance of 69.188% underlines the fact that the reduction of the phenomenon to two dimensions can allow us to explain the measured phenomenon by 15 variables. (Carricano and Poujol, 2008) (Table 3)

Table 3. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.455	49.698	49.698	7.455	49.698	49.698	6.529	43.524	43.524
2	2.923	19.490	69.188	2.923	19.490	69.188	3.850	25.664	69.188
3	1.610	10.735	79.923						
4	0.985	6.564	86.487						
5	0.523	3.485	89.973						
6	0.400	2.664	92.636						
7	0.357	2.379	95.016						
8	0.327	2.181	97.196						
9	0.159	1.063	98.259						
10	0.115	0.766	99.026						
11	0.088	0.589	99.615						
12	0.041	0.270	99.885						
13	0.011	0.074	99.959						
14	0.005	0.032	99.991						
15	0.001	0.009	100.000						

Extraction Method: Principal Component Analysis.

Source: Data analysis using SPSS 21.00 software

The results from the Table 4 allow us to define the ICT use indicators for cultural purpose. The rotated component matrix shows the extracted factors with the dimensions for each factor:

- Factor 1: Entertainment. This factor underlines the use of ICT to: seek health information, watch internet streamed TV or videos, watch video on demand from commercial services, watch video content from sharing services, watch video content from commercial or sharing services, find information about goods and services, use Internet banking, buy travel and accommodation services, watch internet streamed TV (live or catch-up) from TV broadcasters, manage a payment account to (potentially) pay for goods or services purchased over the internet, send/receive e-mails;
- Factor 2: Education. This factor underlines the use of ICT for: online learning material, communicating with instructors or students using educational websites/portals, any of the learning activities, doing an online course (of any subject).

Table 4. Rotated Component Matrix

	Component	
	1	2
Internet use: seeking health information	0.722	0.234
Internet use: watching internet streamed TV or videos	0.840	0.309
Internet use: watching video on demand from commercial services	0.819	0.193
Internet use: watching video content from sharing services	0.744	0.244
Internet use: watching video content from commercial or sharing services	0.793	0.253
Internet use: finding information about goods and services	0.732	0.113
Internet use: Internet banking	0.764	0.256
Internet use: travel and accommodation services	0.757	-0.039
Internet use: watching internet streamed TV (live or catch-up) from TV broadcasters	0.721	0.380
Internet use: managing a payment account to (potentially) pay for goods or services purchased over the internet	0.791	-0.174
Internet use: sending/receiving e-mails	0.721	-0.010
Internet use: online learning material	0.093	0.946
Internet use: communicating with instructors or students using educational websites/portals	0.183	0.910
Internet use: any of the learning activities	0.063	0.968
Internet use: doing an online course (of any subject)	0.210	0.791
Extraction Method: Principal Component Analysis.		
Rotation Method: Varimax with Kaiser Normalization.		
a. Rotation converged in 3 iterations.		

Source: Data analysis using SPSS 21.00 software

At this stage, we will follow the next step in determining the viability of the scale, using the coefficient Cronbach's Alpha. This scale has an acceptable viability of internal coherence, the value of Cronbach's Alpha being 0.909. (Table 5)

Table 5. Reliability Statistics

Cronbach's Alpha	N of Items
0.909	14

Source: Data analysis using SPSS 21.00 software

The table 6 underlines the correlation between the chosen variables, together with the value of Cronbach's Alpha in case that a variable is eliminated.

Table 6. Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Internet use: seeking health information	546.1071	10778.321	0.717	0.900
Internet use: watching internet streamed TV or videos	536.5357	9760.702	0.885	0.890
Internet use: watching video on demand from commercial services	586.6429	10016.090	0.806	0.894
Internet use: watching video content from sharing services	544.3571	9875.868	0.745	0.897
Internet use: watching video content from commercial or sharing services	541.9643	9715.517	0.805	0.894
Internet use: finding information about goods and services	524.5000	10833.444	0.634	0.902
Internet use: travel and accommodation services	561.2857	10172.508	0.606	0.904
Internet use: online learning material	590.3571	11590.090	0.400	0.909

Internet use: communicating with instructors or students using educational websites/portals	596.0714	11639.254	0.464	0.908
Internet use: any of the learning activities	584.6786	11463.115	0.355	0.910
Internet use: watching internet streamed TV (live or catch-up) from TV broadcasters	571.1071	9964.173	0.756	0.896
Internet use: managing a payment account to (potentially) pay for goods or services purchased over the internet	576.2500	9865.009	0.582	0.908
Internet use: sending/receiving e-mails	521.0714	11195.995	0.574	0.905
Internet use: doing an online course (of any subject)	599.3929	11875.136	0.459	0.910

Source: Data analysis using SPSS 21.00 software

4. Results

In everyday life, people interact with ICT technology. According to the research made, the main drivers of ICT use for cultural purposes across Eu-28 countries are (Table 7):

- Internet use: seeking health information (with variations from 40% to 73% at the level of EU-28);
- Internet use: watching internet streamed TV or videos (with variations from 36% to 88% at the level of EU-28);
- Internet use: watching video on demand from commercial services (with variations from 4% to 49% at the level of EU-28);
- Internet use: watching video content from sharing services (with variations from 25% to 80% at the level of EU-28);
- Internet use: watching video content from commercial or sharing services (with variations from 26% to 82% at the level of EU-28);
- Internet use: finding information about goods and services (with variations from 50% to 92% at the level of EU-28);
- Internet use: Internet banking (with variations from 7% to 92% at the level of EU-28);

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- Internet use: travel and accommodation services (with variations from 21% to 73% at the level of EU-28).
- Internet use: watching Internet streamed TV (live or catch-up) from TV broadcasters (with variations from 15% to 70% at the level of EU-28).
- Internet use: managing a payment account to (potentially) pay for goods or services purchased over the Internet (with variations from 1% to 86% at the level of EU-28).
- Internet use: sending/receiving e-mails (with variations from 70% to 96% at the level of EU-28).
- Internet use: online learning material (with variations from 0% to 29% at the level of EU-28).
- Internet use: communicating with instructors or students using educational websites/portals (with variations from 0% to 29% at the level of EU-28).
- Internet use: any of the learning activities (with variations from 0% to 45% at the level of EU-28).
- Internet use: doing an online course (of any subject) (with variations from 0% to 15% at the level of EU-28).

Table 7. Drivers of ICT use for cultural purposes within EU-28 (2016)

	N	Mean	Std. Deviation	Min.	Max.
Internet use: seeking health information	28	60.0714	9.22127	40	73
Internet use: watching internet streamed TV or videos	28	69.6429	13.16621	36	88
Internet use: watching video on demand from commercial services	28	19.5357	12.75258	4	49
Internet use: watching video content from sharing services	28	61.8214	14.52215	25	80
Internet use: watching video content from commercial or sharing services	28	64.2143	14.54586	26	82
Internet use: finding information about goods and services	28	81.6786	9.88472	50	92
Internet use: Internet banking	28	59.5714	22.8318	7	92
Internet use: travel and accommodation services	28	44.8929	15.02674	21	73
Internet use: watching internet streamed TV (live or catch-up) from TV broadcasters	28	35.0714	13.79997	15	70
Internet use: managing a payment account to (potentially) pay for	28	29.9286	17.76999	1	86

goods or services purchased over the internet					
Internet use: sending/receiving e-mails	28	85.1071	8.03391	70	96
Internet use: online learning material	28	15.8214	6.93917	0	29
Internet use: communicating with instructors or students using educational websites/portals	28	10.1071	5.64597	0	29
Internet use: any of the learning activities	28	21.5	9.07377	0	45
Internet use: doing an online course (of any subject)	28	6.7857	3.48921	0	15

Source: Data analysis using SPSS 21.00 software

5. Conclusions

The purpose of the research was to analyse two key factors that are closely linked to culture, namely ICT for entertainment and ICT for education, within the 28 countries of the European Union.

Entertainment and education are the main influencers for culture, mainly related to ICT use.

Thus, the first factor, entertainment underlines the use of ICT to: seek health information, watch internet streamed TV or videos, watch video on demand from commercial services, watch video content from sharing services, watch video content from commercial or sharing services, find information about goods and services, use Internet banking, buy travel and accommodation services, watch internet streamed TV (live or catch-up) from TV broadcasters, manage a payment account to (potentially) pay for goods or services purchased over the internet, send/receive e-mails.

The second factor, education, underlines the use of ICT for: online learning material, communicating with instructors or students using educational websites/portals, any of the learning activities, doing an online course (of any subject).

The current research can be considered a starting point for new research in the field of new technology development and its influence of the main areas of the economy.

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