Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Data Article

Digital literacy and e-learning experiences among the pre-service teachers

Authors
Łukasz Tomczyk

Affiliations
Uniwersytet Pedagogiczny im. Komisji Edukacji Narodowej, Poland

Corresponding author(s)
lukasz.tomczyk@up.krakow.pl

Abstract
The data show different issues connected with the digital literacy of pre-service teachers. The data were collected in 2019 among 450 teachers of pedagogical studies in Poland. The research was conducted in the biggest Polish university that trains educational staff, the Pedagogical University of Cracow. The data describe issues related to the self-evaluation of digital literacy in using text editors, spreadsheets, and presentation and graphic software. They also describe experiences with e-learning: participation in obligatory online classes, searching for information on the Internet, participation in paid and free e-learning courses, and participation in informal study groups.

Keywords
Digital literacy, pre-service teachers; students; e-learning; self-evaluation; Poland; University; information society

Specifications Table

| Subject                  | Social Sciences, Education |
|--------------------------|----------------------------|
| Specific subject area    | The research is in the area of media education (pedagogy). The data show the level of self-evaluation of digital literacy among students of pedagogy, and experiences with e-learning among pre-service teachers. |
| **Type of data**       | Table                                                                 |
|------------------------|----------------------------------------------------------------------|
| **How data were acquired** | Diagnostic survey carried out online Direct URL to research tool (file tool. docx): Tomczyk, Lukasz (2020), “E-learning and digital literacy among pre-service teachers”, Mendeley Data, v2http://dx.doi.org/10.17632/c58bkzr9hf.2 |
| **Data format**        | Raw                                                                  |
| **Parameters for data collection** | The sampling criteria were: status of the student of the Pedagogical University of Cracow in the direction of pedagogy, specialisation: teaching. |
| **Description of data collection** | The data were collected through quantitative pedagogical research. For this purpose, the technique of the diagnostic survey and online questionnaire was used. The data are available in a standard layout in the Mendeley repository. Each of the variables used in the article is described in the first line [9]. |
| **Data source location** | Institution: Pedagogical University of Cracow City/Town/Region: Cracow, Lesser Poland Country: Poland Latitude and longitude (and GPS coordinates, if possible) for collected samples/data: Latitude: 50.061664 | Longitude: 19.921143 |
| **Data accessibility** | Repository name: Mendeley Data identification number: E-learning and digital literacy among pre-service teachers, 10.17632/c58bkzr9hf.2 Direct URL to data: https://data.mendeley.com/datasets/c58bkzr9hf/2 File: Data in Brief repository.xls Instructions for accessing these data: Standard access via Mendeley |

**Value of the Data**

- The data show the level of digital literacy and e-learning experiences among students at the biggest pedagogical university in Poland. They enable a comparison of digital literacy self-evaluations and e-learning experiences of the respondents.
The data may be used by media educators who deal with diagnosing the key competencies in the use of digital media among pre-service teachers, as well as researchers who conduct analyses of the conditions of academic e-learning.

The data may be used to plan experiments, surveys and longitudinal studies connected with the use of new technologies among pre-service teachers. This type of research also enables the tracking of changes which are occurring in the rapidly developing information society.

The data may contribute to the improvement of the obligatory academic courses used in preparing future teachers. It may also be of interest to those who design solutions to modernize school and university education. The data may also be of interest to media sociologists.

Due to the COVID-19 pandemic and the resulting radical changes in the system of academic education, the data are unique. The vast majority of academic activities (lectures, discussions) has been transferred into the online world. This means that our data may prove useful when comparing the self-evaluation of digital literacy and e-learning experiences from before and during the COVID-19 pandemic.

Data Description

Table 1 presents descriptive statistics related to the experiences of the students with online education during the last year. The data show basic descriptive statistics for the main activities connected with the obligatory online classes, searching for information on the Internet, and participation in paid and free e-learning courses and study groups that use ICT. The scale for the data in Table 1 was between 1 - never and 5 - very often.

Table 1 Descriptive statistics for experiences in e-learning among pre-service teachers

| I took part in online courses required in the official study curriculum or as part of my professional development | I search for relevant resources in the Internet to complete online classes | I took part in free e-learning courses (online courses, for example, foreign languages, ICT) | I took part in paid online courses | I took part in online joint study groups |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------|
| **Valid**                                                                                                             | 450                                                                           | 450                                                                                      | 450                             | 450                                    | 450                                    |
| **Missing**                                                                                                           | 0                                                                             | 0                                                                                        | 0                               | 0                                       | 0                                       |
| **Mean**                                                                                                              | 2.353                                                                         | 2.984                                                                                    | 2.051                           | 1.173                                   | 1.587                                   |
| **Std. Error of Mean**                                                                                                 | 0.074                                                                         | 0.077                                                                                    | 0.073                           | 0.062                                   | 0.072                                   |
| **Median**                                                                                                             | 3.000                                                                         | 3.000                                                                                    | 2.000                           | 1.000                                   | 1.000                                   |
| **Mode**                                                                                                               | 3.000                                                                         | 4.000                                                                                    | 1.000                           | 0.000                                   | 0.000                                   |
| **Std. Deviation**                                                                                                     | 1.579                                                                         | 1.629                                                                                    | 1.542                           | 1.312                                   | 1.517                                   |
| **Skewness**                                                                                                          | -0.090                                                                        | -0.503                                                                                  | 0.203                           | 1.247                                   | 0.757                                   |
| **Std. Error of Skewness**                                                                                              | 0.115                                                                         | 0.115                                                                                    | 0.115                           | 0.115                                   | 0.115                                   |
| **Kurtosis**                                                                                                          | -1.109                                                                        | -0.910                                                                                  | -1.100                          | 0.944                                   | -0.499                                  |
I took part in online courses required in the official study curriculum or as part of my professional development. I search for relevant resources in the Internet to complete online classes. I took part in free e-learning courses (online courses, for example, foreign languages, ICT). I took part in paid online courses. I took part in online joint study groups.

| Std. Error of Kurtosis | 0.230 | 0.230 | 0.230 | 0.230 | 0.230 |
|------------------------|-------|-------|-------|-------|-------|
| Shapiro-Wilk            | 0.914 | 0.890 | 0.910 | 0.806 | 0.863 |
| P-value of Shapiro-Wilk | < .001 | < .001 | < .001 | < .001 | < .001 |
| Minimum                 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |
| Maximum                 | 5.000 | 5.000 | 5.000 | 5.000 | 5.000 |

Table 2 presents descriptive statistics related to the self-evaluation of digital literacy in four key areas. The scale for the data in Table 2 is the evaluation of the respondent's own digital literacy and is between 1 - very poor and 5 - very strong.

Table 2 Descriptive statistics for self-evaluation of digital literacy among pre-service teachers

| How do you rate your ICT skills in the following areas? - Using text editor (e.g. Word) | How do you rate your ICT skills in the following areas? - Using spreadsheet (e.g. Excel, Calc) | How do you rate your ICT skills in the following areas? - Using presentation software (e.g. Power Point) | How do you rate your ICT skills in the following areas? - Using graphic software (e.g. Picasa, Gimp) |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Valid                                                                                   | 450                                                                                           | 450                                                                                              | 450                                                                                          |
| Missing                                                                                | 0                                                                                             | 0                                                                                               | 0                                                                                            |
| Mean                                                                                   | 3.791                                                                                         | 3.158                                                                                            | 3.902                                                                                        | 2.898                                                                                       |
| Std. Error of Mean                                                                    | 0.045                                                                                         | 0.046                                                                                            | 0.043                                                                                        | 0.053                                                                                       |
| Median                                                                                 | 4.000                                                                                         | 3.000                                                                                            | 4.000                                                                                        | 3.000                                                                                       |
| Mode                                                                                   | 4.000                                                                                         | 3.000                                                                                            | 4.000                                                                                        | 3.000                                                                                       |
| Std. Deviation                                                                        | 0.949                                                                                         | 0.972                                                                                            | 0.922                                                                                        | 1.130                                                                                       |
| Skewness                                                                              | -0.656                                                                                        | -0.013                                                                                            | -0.712                                                                                        | -0.012                                                                                      |
| Std. Error of Skewness                                                                 | 0.115                                                                                         | 0.115                                                                                            | 0.115                                                                                        | 0.115                                                                                       |
| Kurtosis                                                                              | 0.253                                                                                         | -0.094                                                                                            | 0.248                                                                                        | -0.663                                                                                      |
| Std. Error of Kurtosis                                                                 | 0.230                                                                                         | 0.230                                                                                            | 0.230                                                                                        | 0.230                                                                                       |
| Shapiro-Wilk                                                                          | 0.868                                                                                         | 0.896                                                                                            | 0.855                                                                                        | 0.914                                                                                       |
| P-value of Shapiro-Wilk                                                                | < .001                                                                                        | < .001                                                                                            | < .001                                                                                        | < .001                                                                                       |
| Minimum                                                                                | 1.000                                                                                         | 1.000                                                                                            | 1.000                                                                                        | 1.000                                                                                       |
| Maximum                                                                                | 5.000                                                                                         | 5.000                                                                                            | 5.000                                                                                        | 5.000                                                                                       |
Table 3 presents data on the Pearson’s linear correlation between e-learning activities and the self-evaluation of digital literacy. The table presents 10 indicators. The confidence level is provided below the table.

Table 3 Linear correlation between digital literacy self-evaluation components and e-learning experiences

| Variable                                                                 | 1          | 2          | 3          | 4          | 5          | 6          | 7          | 8          | 9          | 10         |
|--------------------------------------------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 1. I took part in online courses required in the official study curriculum or as part of my professional development | —          |            |            |            |            |            |            |            |            |            |
| 2. I search for relevant resources in the Internet to complete online classes | 0.604 ***  | —          |            |            |            |            |            |            |            |            |
| 3. I took part in free e-learning courses (online courses, for example, foreign languages, ICT) | 0.477 *** 0.426 *** — |            |            |            |            |            |            |            |            |            |
| 4. I took part in paid online courses                                     | 0.326 *** 0.235 *** 0.486 *** — |            |            |            |            |            |            |            |            |            |
| 5. I took part in online joint study groups                               | 0.366 *** 0.308 *** 0.468 *** 0.579 *** — |            |            |            |            |            |            |            |            |            |
| 6. How do you rate your ICT skills in the following areas? -              | 0.260 *** 0.311 *** 0.175 *** 0.088 0.187 *** — |            |            |            |            |            |            |            |            |            |
| Using text editor (e.g. Word)                                            | 0.181 *** 0.186 *** 0.170 *** 0.185 *** 0.197 *** 0.555 *** — |            |            |            |            |            |            |            |            |            |
| 7. How do you rate your ICT skills in the following areas? -              | 0.236 *** 0.290 *** 0.126 ** 0.018 0.108 * 0.748 *** 0.490 *** — |            |            |            |            |            |            |            |            |            |
| Using spreadsheet (e.g. Excel, Calc)                                     | 0.238 *** 0.178 *** 0.233 *** 0.233 *** 0.265 *** 0.395 *** 0.532 *** 0.390 *** — |            |            |            |            |            |            |            |            |            |
| 8. How do you rate your ICT skills in the following areas? -              | 0.236 *** 0.178 *** 0.233 *** 0.233 *** 0.265 *** 0.395 *** 0.532 *** 0.390 *** — |            |            |            |            |            |            |            |            |            |
| Using presentation software (e.g. Power Point)                           | 0.238 *** 0.178 *** 0.233 *** 0.233 *** 0.265 *** 0.395 *** 0.532 *** 0.390 *** — |            |            |            |            |            |            |            |            |            |
| 9. How do you rate your ICT skills in the following areas? -              | 0.238 *** 0.178 *** 0.233 *** 0.233 *** 0.265 *** 0.395 *** 0.532 *** 0.390 *** — |            |            |            |            |            |            |            |            |            |
| Using graphic software (e.g. Picasa, Gimp)                              | 0.236 *** 0.178 *** 0.233 *** 0.233 *** 0.265 *** 0.395 *** 0.532 *** 0.390 *** — |            |            |            |            |            |            |            |            |            |
| 10. Age                                                                  | 0.074 0.024 0.090 0.107* 0.007 0.120* 0.097* 0.037 0.037 0.015 — |            |            |            |            |            |            |            |            |            |

* p < .05, ** p < .01, *** p < .001

Table 4 presents data regarding the relationships between the self-evaluation of digital literacy and online activities.

Table 4 Multilinear regression analysis where the dependent variable is self-evaluation of digital literacy in using text editor

| Dependent variable - Using text editor (e.g. Word) R=.337 R^2=.113 R^2=.103 F(5.444)=11.400 p<0.001
| N=450 | β | SE | b | SE (b) | t(444) | p |
|-------|---|----|---|--------|--------|---|
|       |   |    |   |        |        |   |
I took part in online courses required in the official study curriculum or as part of my professional development 0.098 0.059566 0.059041 0.035810 1.64873 0.099910
I search for relevant resources in the Internet to complete online classes 0.227310 0.057358 0.132455 0.033423 3.96303 0.000086
I took part in free e-learning courses (online courses, for example, foreign languages, ICT) 0.010087 0.057362 0.006207 0.035299 0.17585 0.860490
I took part in paid online courses -0.070134 0.057562 -0.050743 0.041647 -1.21841 0.223715
I took part in online joint study groups 0.117453 0.057531 0.073481 0.035993 2.04156 0.041786

Table 5 Multilinear regression analysis where the dependent variable is self-evaluation of digital literacy in using spreadsheet

| N=450                                                                 | Dependent variable - Using text spreadsheet R=.253 R^2=.064 R^2=.053 F(5,444)=6.100 p<0.001 |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| β | SE (b)   | SE (b) | t(444) | p           |
| 2.716749 | 0.098672 | 27.53318 | 0.000000 |

I took part in online courses required in the official study curriculum or as part of my professional development 0.051914 0.061207 0.031951 0.037670 0.84817 0.396798
I search for relevant resources in the Internet to complete online classes 0.098544 0.058937 0.058786 0.035159 1.67200 0.095228
I took part in free e-learning courses (online courses, for example, foreign languages, ICT) 0.021149 0.058942 0.013324 0.037132 0.35882 0.719902
I took part in paid online courses 0.082133 0.059148 0.060835 0.043810 1.38860 0.165649
I took part in online joint study groups 0.090223 0.059116 0.057786 0.037862 1.52621 0.127669

Table 6 Multilinear regression analysis where the dependent variable is self-evaluation of digital literacy in using presentation software

| N=450                                                                 | Dependent variable - Using presentation software R=.308 R^2=.095 R^2=.0848 F(5,444)=9.322 p<0.001 |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| β | SE (b)   | SE (b) | t(444) | p           |
| 3.396852 | 0.092093 | 36.88518 | 0.000000 |

I took part in online courses required in the official study curriculum or as part of my professional development 0.092363 0.060194 0.053948 0.035159 1.53443 0.125637
I search for relevant resources in the Internet to complete online classes 0.238903 0.057962 0.135253 0.032815 4.12173 0.000045
I took part in free e-learning courses (online courses, for example, foreign languages, ICT) 0.002472 0.057966 0.001478 0.034657 0.04264 0.966005
I took part in paid online courses -0.104471 0.058169 -0.073437 0.040889 -1.79600 0.073174
I took part in online joint study groups 0.060028 0.058137 0.036487 0.035338 1.03251 0.302394
Table 7 Multilinear regression analysis where the dependent variable is self-evaluation of digital literacy in using graphic software

|                      | Dependent variable - Using graphic software R= .319 R^2= .101 R2= .0917 F(5,444)=10.073 p<0.001 |
|----------------------|------------------------------------------------------------------------------------------------|
|                      | β      | SE     | b      | SE (b) | t(444) | p       |
| took part in online courses required in the official study curriculum or as part of my professional development | 0.119421 | 0.059965 | 0.112434 | 0.085485 | 20.62599 | 0.000000 |
| I search for relevant resources in the Internet to complete online classes | 0.016724 | 0.057741 | 0.011603 | 0.040063 | 0.28963 | 0.772234 |
| I took part in free e-learning courses (online courses, for example, foreign languages, ICT) | 0.065802 | 0.057746 | 0.048215 | 0.042312 | 1.19952 | 0.255100 |
| I took part in paid online courses | 0.076237 | 0.057947 | 0.065677 | 0.049921 | 1.31563 | 0.188978 |
| I took part in online joint study groups | 0.141246 | 0.057916 | 0.105218 | 0.043143 | 2.43880 | 0.015127 |

Experimental Design, Materials and Methods

The research was conducted in the second half of 2019 in Poland (Pedagogical University of Cracow). There were 450 respondents - students of pedagogical studies. The average age of the respondents was 22.6 years, with standard deviation 4.232. The goal of the research was the self-diagnosis of the level of basic digital literacy and experiences connected with e-learning. The data are of particular value from a temporal perspective because they cover the experiences of the respondents during the COVID-19 pandemic. Thus, they enable comparisons of the results from before the pandemic and at present. The data are particularly useful for improving the curricula of studies used in preparing future teaching staff.

The research was conducted using a triangulation of the research tools. For this purpose, the scale measuring the self-evaluation of digital literacy was used [1] [2]. To diagnose e-learning experiences, mixed research tools were used. By this means, the following elements were investigated: participation in obligatory online classes [3], searching for information on the Internet [4], participation in paid and free e-learning courses [5] and participation in informal study groups [6]. Each item had a classic 5-degree Likert scale which enabled self-evaluation and the determination of the frequency of use of e-learning solutions during the last year. The research was intended as diagnostic and as one of the elements in an international joint project of universities from Latin America, the Caribbean and Europe. The data collected also enable longitudinal studies embedded in the opportunities paradigm of media pedagogy. The whole tool presents a satisfactory level of inner coherence: McDonald’s ω = 0.804; Cronbach’s α = 0.796; Gutmann’s λ6 = 0.843.

Ethics Statement
The data were collected among students of pedagogical studies. Participation in the research was voluntary. Each of the students was able to refuse to take part or withdraw from the research at any stage. The research was conducted by a team of qualified researchers with experience in quantitative pedagogical studies within the opportunities paradigm of media pedagogy. The diagnostic survey was designed in such a way as to ensure the anonymity of the respondents. At the beginning of the data collection process, the students were also informed about the goal of the research, the procedure, data storage and the methods of analysis.

Acknowledgments

This work was supported by the ERANET-LAC project which has received funding from the European Union Seventh Framework Programme. Project Smart Eco-system for Learning and Inclusion – ERANet17/ICT-0076SELI (SELI). In Poland support for the research was provided by the National Centre for Research and Development (Narodowe Centrum Badań i Rozwoju). The data are taken from WP2.2, a SELI project in Latin American, European and Caribbean countries. The data concerns only the Polish research sample. A detailed description of the tool and access to the data are both available through the Mendeley repository [9].

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships which have, or could be perceived to have, influenced the work reported in this article.
References

[1] Eger, L., Klement, M., Tomczyk, Ł., Pisoňová, M., Petrová, G. Different user groups of university students and their ICT competence: evidence from three countries in central Europe. Journal of Baltic Science Education, 17(5), (2018), 851.

[2] Stošić, L., & Stošić, I. Perceptions of teachers regarding the implementation of the internet in education. Computers in Human Behavior, (2015), 53, 462-468.

[3] Eger, L. Is Facebook a similar learning tool for university students as LMS? Procedia-Social and Behavioral Sciences, 203, (2015), 233-238.

[4] Eger, L., & Egerová, D. E-Learning trends in central Europe: The case of the Czech Republic. Knowledge Management & E-Learning: An International Journal, 5(3), (2013), 375-387.

[5] Klement, M., & Dostál, J. Students and e-learning: a longitudinal research study into university studentsopinions on e-learning. Procedia-Social and Behavioral Sciences, 128, (2014) 175-180.

[6] Frania, M. New educational trends connected with the development of media and innovative technologies–A few reflections on the future perspectives on learning and teaching. Journal of Educational and Social Research, 4(4), (2014), 232.

[7] Tomczyk, Ł. & Oyelere, S. S., ICT for learning and inclusion in Latin America and Europe. Cracow: Pedagogical University of Cracow, Cracow, 2019.

[8] Novković Cvetković, B., Stošić, L., & Belousova, A. Media and Information Literacy-the Basis for Applying Digital Technologies in Teaching from the Discourse of Educational Needs of Teachers. Croatian Journal of Education: Hrvatski časopis za odgoj i obrazovanje, 20(4), (2018), 1089-1114.

[9] Tomczyk, Lukasz, E-learning and digital literacy among pre-service teachers, Mendeley Data, v2, 2020, http://dx.doi.org/10.17632/c58bkzr9hf.2