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Digital and Reading Literacy of students of Secondary Technical Schools in the Moravian-Silesian Region

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Abstract The aim of the study is to point out the issue of digital and reading literacy of pupils of secondary technical schools. The paper is based on quantitatively oriented questionnaire research, focused on the use of various types of (e) communication and reading in the technical subjects teaching. The research dealt with the pupils' interest in working with electronic, digital or traditional texts in the teaching of vocational subjects. Six hundred forty-nine students of technical high schools in the Moravian-Silesian Region of the Czech Republic took part in the survey. Chi-square research has shown that students who prefer to work with traditional textbook texts in paper form read texts from "everyday life" more frequently than students who do not prefer paper form in learning engineering subjects.

Keywords digital and reading literacy, types of communication, teaching technical subjects, teaching resources and texts

1. INTRODUCTION

Reading and digital literacy are significant components of functional literacy. The prerequisite for efficient teaching at a secondary technical school is to develop all components of functional literacy. At the same time, the need to develop pupils' reading and digital literacy is growing side by side, aided by the appeal to develop a positive attitude towards reading, an effort to understand the traditional and electronic or digital text, information sharing and ability to apply information from the text to everyday life. Quantitatively oriented questionnaire research carried out by the Faculty of Education of the University of Ostrava found out what types of communication and types of texts influence the level of reading and digital literacy of pupils of secondary technical schools in the Moravian-Silesian Region of the Czech Republic.

2. READING ROLES

Reading roles are influenced by the reading context – family, school and extracurricular. The reader's personality is also crucial in the reading process. What matters is in what way the reader can read the text, without comprehension or with comprehension. Serafini (2012) in agreement with Freebody and Luka (1990) distinguishes four reading roles: reader as code breaker, reader as text participant, reader as text user and reader as text analyst. International surveys by PISA (2018) emphasise the importance of the role of the reader as an evaluator. Researches by Metelková Svobodová (2011), Vicherková (2017, 2018) emphasise a new view of the active reading role of a primary school pupil, which presupposes reading lively activity, interest, motivation leading to the discovery and creation of several levels of meaning of the text. According to Košťálová et al. (2010), Vicherková (2018), reading literacy develops across the teaching of all subjects at all levels of the educational process, not only in the teaching of the Czech language and literature.

3. FACTORS INFLUENCING STUDENTS' RELATIONSHIP TO READING

Reading literacy is a lifelong process. One of the fundamental factors influencing the relationship of pupils to reading is not only the family but also a school, especially teachers and classmates. The reading pattern constructed by an individual throughout lifelong reading is also essential. We can have more reading patterns in different life stages. According to Vicherková, Řeřichová (2016), 15-year-old Czech students have been continually evaluated by international PISA literacy surveys as below average (PISA, 2009) or average readers (PISA, 2000, 2018). Pupils from the Moravian-Silesian Region belong to a group that repeatedly rank in the last places in the testing (PISA, 2018).

3.1 Working with Text

Working with a rich range of (e) texts, both artistic and non-artistic, is one of the critical factors influencing reading and digital literacy. Procházková (2006) pointed out the importance of working with a varied database of teaching resources (texts). "*It is important to provide students with various types of texts, not only in terms of their complexity and prevalence but also concerning their individual preferences*" (Procházková, 2006, p. 12). According to Najvarová (2008), Hyplová (2010), Hejsek (2015), Vicherková (2017) it is necessary to develop reading strategies and reading approaches to reading, e.g. superficial, deep processing. Hejsek (2015) classifies reading strategies according to the character of reading literacy tasks assignments of in international PISA surveys into four categories:

reading localisation, reading cycle, reading integration and reading generation. Other reading strategies towards reading skills (according to PISA) can be combined with information retrieval, information processing, information evaluation. The research by Grecmanová, Urbanovská (2007), Vicherková (2017, 2018) dealt with asking questions before, throughout and after reading the text.

4. DIGITAL LITERACY

The American Library Association (ALA) defined digital literacy as *"the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills"* (ALA, 2020). British association for tertiary education services JISC developed a guide to digital literacy and defined seven parts of digital literacy (e.g. Information literacy, Media literacy, Digital scholarship, Communications and collaboration, Career and identity management, Learning skills, etc.). The use of digital technologies in everyday and school life is a prevalent need today. Digital technologies have changed the lifestyle of 21st-century society in many ways. Accelerated means of behaviour, communication and experience also requires a person's interest in digital security. The combination of the classic skill of reading with comprehension and digital competence is also a part of currently valid curricular documents of all levels of the Czech schooling system. In March 2020, in the currently unexpected time of the closure of Czech schools, during the pandemic - COVID 19, the importance of the appeal to the development of reading and digital literacy of pupils across all levels of schools and the lifelong need for further education of Czech teachers in reading and digital literacy and training in new communication technologies was demonstrated. The problem of the level of reading and digital literacy of pupils of secondary technical schools (the so-called digital generation) is current and timeless.

5. RESEARCH METHODOLOGY

As part of the SGS project, the Faculty of Education carried out a quantitatively oriented questionnaire survey in January-March 2020 focusing on reading and digital literacy of pupils at secondary technical schools in the Moravian-Silesian Region of the Czech Republic. The questionnaire survey was conducted on a sample of 649 pupils (aged 15-19) of secondary technical schools with a focus on mechanical engineering, computer technology and the automotive industry, transport. The questionnaire contained a total of 15 items, 14 of which were closed, and one was open. Six items (3, 4, 6, 7, 11,12) are presented in the study; their wording is given in part of selected research outputs in descriptive and statistical form. The research aims to point out selected statistically verified connections between variables.

5.1 Descriptive Analysis Results

Question 3: *Do you use (for active communication, reading, writing, etc.) communication applications (e.g. WhatsApp) in the teaching of engineering subjects?*

The item analysed (by choosing from two options) whether the pupils use/do not use communication applications (e.g. WhatsApp) in the teaching of engineering subjects. The research results confirm that 198 (30.51%) respondents stated that they use communication applications in the teaching of engineering subjects and 451 (69.49%) respondents stated that they do not use communication applications in the teaching of engineering subjects.

Question 4: *Do you use (for active communication, reading, writing, etc.) social networks in the teaching of engineering-oriented subjects?*

The item analysed (by choosing from two options) whether the pupils use/do not use social networks in the teaching of engineering subjects. The research results confirm that 186 (28.66%) respondents stated that they use social networks in the teaching of engineering subjects and 463 (71.34%) respondents stated that they do not use social networks in the teaching of engineering subjects.

Question 6: *Do you expand your professional engineering terminology by reading texts on social networks?*

The item analysed (by choosing from two options) whether the pupils expand/do not expand their professional engineering terminology by reading texts on social networks. The research results confirm that 211 (32, 51%) respondents stated that they expand their technical engineering terminology by reading texts on social networks in the teaching of engineering subjects and 438 (67, 49%) respondents do not expand professional engineering terminology by reading texts on social networks in the teaching of engineering subjects.

Question 7: *Do you expand your professional engineering terminology by reading texts in the environment of communication applications (e.g. WhatsApp)?*

The item analysed (by choosing from two options) whether students expand/do not expand their professional engineering terminology by reading texts in the environment of communication applications (e.g. WhatsApp). The research results confirm that 111 (17, 10%) respondents stated that they expand their professional engineering terminology by reading texts in the environment of communication applications in the teaching of engineering subjects and 538 (82, 90%) respondents do not expand professional engineering terminology by reading texts in the environment of communication applications in teaching engineering subjects.

Question 11: *Do you work with texts from "everyday life" in the teaching of engineering subjects (e.g. information leaflets, business instructions for work procedures, drawings of products for sale, etc.)?*

The item analysed (by choosing from two options) whether students work with texts from "everyday life" in the teaching of engineering subjects. The research results confirm that 121 (18.64) respondents stated that they work with texts from "everyday life" (e.g. information leaflets, business instructions for work procedures, drawings of products for sale, etc.) in the teaching of engineering subjects and 528 (81.36%) respondents do not work with texts from "everyday life" in the teaching of engineering subjects.

Question 12: *Do you prefer to work with traditional textbook texts in the paper text in the teaching of engineering-oriented subjects?*

The item analysed (by choosing from two options) whether students are more likely to work with traditional textbook texts in the paper text in the teaching of engineering subjects.

The research results confirm that 226 (34, 82%) respondents stated that they prefer to work with traditional textbook texts in the paper text in the teaching of engineering subjects and 423 (65.18%) respondents do not like to work with traditional textbook texts in the paper text in the teaching of engineering subjects.

5.2 Statistical Analysis Results

Below, we present comprehensive hypotheses with the results of their verification.

Hypothesis No. 1 "Pupils preferring to work with traditional textbook texts in paper form in the teaching of engineering subjects work with texts from "everyday life" (e.g. information leaflets, business procedures, drawings of products for sale, etc.) more frequently than pupils who do not prefer to work with traditional textbook texts in the paper form."

Tab. 1 Observed and expected frequencies (H1)

Contingency table Pearson's chi-square = 4.35520 degree of freedom= 1 significance p= 0.036896			
Question No. 12	Question No. 11 - yes	Question No. 11 - no	Line totals
Yes	52 (42.14)	174 (183.86)	226
No	69 (78.86)	354 (344.14)	423
Column totals	121	528	649

Source: self-processing

Conclusion: Since the calculated chi-square value is higher than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been confirmed that there is a statistically significant relationship between the answers to both questions.
Therefore, we accept hypothesis H1 at the significance level of 0.05.

Hypothesis No. 2 "Pupils who use (for communication, reading, writing, etc.) communication applications (e.g. WhatsApp) in the teaching of engineering subjects, work with texts from "everyday life" (e.g. information leaflets, business workflows, product drawings for sales, etc.) more frequently than students who do not use (for active communication, reading, writing, etc.) communication applications (e.g. WhatsApp) in the teaching of engineering subjects."

Tab. 2 Observed and expected frequencies (H2)

Contingency table Pearson's chi-square = 3.13188 degree of freedom= 1 significance p= 0.76775			
Question No. 3	Question No. 11 - yes	Question No. 11 - no	Line totals
Yes	45 (36.92)	153 (161.08)	198
No	76 (84.08)	375 (366.92)	451
Column totals	121	528	649

Source: self-processing

Conclusion: Since the calculated chi-square value is less than the test criterion value and the significance value is higher than the chosen significance level of 0.05, it has not been confirmed that there is a statistically significant relationship between the answers to the two questions.
Therefore, we reject hypothesis H2 at the significance level of 0.05.

Hypothesis No. 3 "Pupils who use (for active communication, reading, writing, etc.) social networks in the teaching of engineering subjects expand their technical engineering terminology more frequently than pupils who do not use (do not participate in an active communication, reading, writing, etc.) social networks in the teaching of engineering subjects."

Tab. 3 Observed and expected frequencies (H3)

Contingency table Pearson's chi-square = 26.028483 degree of freedom= 1 significance p= 0.033642E-05			
Question No. 4	Question No. 6 - yes	Question No. 6 - no	Line totals
Yes	88 (60.47)	98 (125.53)	186
No	123 (150.53)	340 (312.47)	463
Column totals	211	438	649

Source: self-processing

Conclusion: Since the calculated chi-square value is higher than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been confirmed that there is a statistically significant relationship between the answers to both questions.
Therefore, we accept hypothesis H3 at the significance level of 0.05.

Hypothesis No. 4 "Pupils who use (for active communication, reading, writing, etc.) a communication application (e.g. WhatsApp) in the teaching of engineering subjects expand professional engineering terminology more frequently by reading texts in the environment of the communication applications (e.g. WhatsApp) than students who do not use (do not participate in an active communication, reading, writing, etc.) communication applications (e.g. WhatsApp) in the teaching of engineering-oriented subjects."

Tab. 4 Observed and expected frequencies (H4)

Contingency table Pearson's chi-square = 18.77029 degree of freedom= 1 significance p= 0.000014745			
Question No. 3	Question No. 7 - yes	Question No. 7 - no	Line totals
Yes	53 (33.86)	145 (164.14)	198
No	58 (77.14)	393 (373.86)	451
Column totals	111	538	649

Source: self-processing

Conclusion: Since the calculated chi-square value is higher than the test criterion value and the significance value is less than the chosen significance level of 0.05, it has been confirmed that there is a statistically significant relationship between the answers to both questions.
Therefore, we accept hypothesis H4 at the significance level of 0.05

6. CONCLUSIONS

The main findings of the questionnaire survey confirm that:

- 198 (30.51%) respondents stated that they use communication applications in the teaching of engineering-oriented subjects,
- 186 (28.66%) respondents stated that they use social networks in the teaching of engineering-oriented subjects,
- 211 (32.51%) respondents stated that they expand their professional engineering terminology by reading texts on social networks in the teaching of engineering subjects,
- 111 (17.10%) respondents stated that they expand their professional engineering terminology by reading texts in the environment of communication applications (e.g. WhatsApp) in the teaching of engineering subjects,
- 121 (18.64%) respondents stated that they work with texts from "everyday life" in the teaching of engineering-oriented subjects,

- 226 (34.82%) respondents stated that they prefer to work with traditional textbook texts in paper text in the teaching of engineering-oriented subjects.

The research has confirmed that:

- Pupils who prefer to work with traditional textbooks in paper text work with texts from everyday life“ in the teaching of engineering subjects more frequently than pupils who do not prefer to work with traditional textbook texts in paper form.
- Pupils who use social networks in their teaching of engineering subjects expand their technical engineering terminology more frequently by reading texts on social networks than pupils who do not use social networks in their teaching of engineering subjects.
- Pupils who use communication applications in the teaching of engineering subjects expand their technical engineering terminology more frequently than pupils who do not use communication applications in the teaching of engineering subjects by reading texts in the environment of communication applications.

The research has not confirmed that:

- Pupils who use communication applications in the teaching of engineering subjects work with texts from "everyday life" more frequently than pupils who do not use communication applications in the teaching of engineering subjects.

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