

Original scientific paper

EXPLORING THE RELATIONSHIP BETWEEN DIGITAL SKILLS, ONLINE BUYING, AND ENCOUNTERED PROBLEMS ACROSS EUROPE

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Abstract

In the evolving landscape of e-commerce, digital skills serve as a fundamental determinant of effective engagement, influencing the overall online purchasing experience and the ability to address encountered problems. This research, based on Eurostat data for 2021 across 36 European countries, employs quantitative methods, including correlations and regression, to explore the relationship between the level of digital skills, internet purchasing behavior, and the reporting of problems. The study reveals a positive correlation, indicating that a higher level of digital skills is associated with increased internet purchasing. Additionally, individuals with lower digital skills are more likely to refrain from reporting problems during online transactions. These findings offer valuable insights for practitioners and policymakers, highlighting the pivotal role of digital skills in fostering positive online interactions and shaping strategies for a seamless e-commerce experience.

Keywords: E-commerce, Problems encountered when buying online, Eurostat, Regression Analysis

JEL classification: M30

INTRODUCTION

The increasing use of information and communication technologies in the last two decades has provided consumers with greater flexibility through the rise of online shopping (Andreev et al., 2010). This growth, coupled with advancements in computer-aided technology, has made online shopping a prevalent choice not only in developed nations but also in numerous developing countries (Khare, 2016). The widespread adoption of online shopping in recent decades has revolutionized the marketing strategies of many businesses, as consumers have become accustomed to purchasing items online and receiving doorstep deliveries from around the world (Bucko et al., 2018; Mohammad et al., 2018).

Additionally, as consumers increasingly rely on digital channels for shopping, digital skills become a key determinant in the evaluation of online purchasing experiences. Higher digital skills are associated with more positive interactions with online interfaces, increased trust in digital transactions, and a greater likelihood of repeat online purchases (Van Deursen and Van Dijk 2011). Research suggests that digital skills contribute to increased online purchasing by fostering a sense of empowerment and confidence among users (Correa et al. 2010). Consumers proficient in digital skills are better equipped to

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overcome barriers related to technology use, enhancing their overall online shopping experience (Molla and Licker 2005). Moreover, digital skills enable consumers to critically assess online information, make informed decisions, and utilize online security features, thereby mitigating potential risks associated with online transactions (Castells 2001).

The digital divide, characterized by discrepancies in digital skill levels across demographic groups, emphasizes the importance of addressing digital literacy as a means to promote inclusive and equitable participation in online commerce (Warschauer 2003). Therefore, understanding the role of digital skills in the online purchasing process is crucial for businesses, policymakers, and educators to develop interventions that enhance digital literacy and bridge existing gaps, ensuring that a broad spectrum of consumers can fully benefit from the opportunities provided by e-commerce platforms.

Understanding the problems consumers encounter during online purchasing serves as a crucial predictor for shaping their behavior in the digital marketplace. Research indicates that problems such as delays in delivery, unexpected costs, and difficulties with website usability can significantly impact consumer satisfaction and influence future purchasing decisions (Palvia et al. 2018). Consumers tend to evaluate their online shopping experiences based on the effectiveness of resolving encountered problems (Jin and Lin 2015). The identification and analysis of specific problems encountered during online purchasing contribute to the development of predictive models for consumer behavior (Riquelme and Román 2014). Studies have highlighted that the resolution of problems, particularly through efficient customer service and hassle-free return processes, positively correlates with customer loyalty and repeat purchases (Keiningham et al. 2014). Problems encountered can act as critical signals for businesses to address gaps in service quality, optimize operational processes, and enhance overall customer satisfaction (Li and Hitt 2008). Additionally, the literature suggests that consumers who encounter problems during online transactions may share their experiences through online reviews and social media, influencing the perceptions of potential customers and affecting the reputation of the online retailer (Zhang et al. 2019). In conclusion, examining the problems encountered during online purchasing as a predictor provides a holistic understanding of the factors influencing consumer behavior, enabling businesses to implement targeted strategies and interventions that enhance the online shopping experience and contribute to long-term customer satisfaction and loyalty.

The primary goal of this study is to discern the role played by digital skills and the types of problems encountered during online shopping as predictors for internet purchasing behavior. By employing Eurostat data, 2021, encompassing a diverse range of 36 countries, this research aims to provide a comprehensive understanding of the factors influencing individuals' decisions to engage in internet purchasing. The focus will be on quantifying the impact of digital proficiency and the specific challenges faced by consumers during online transactions. To achieve the aforementioned goal, the study will address the following research questions:

RQ1: To what extent do digital skills influence individuals' likelihood to engage in internet purchasing?

RQ2: Are Internet purchasers with lower level of digital skills reporting less problems encountered during online shopping?

Through a quantitative analysis of Eurostat data, this study seeks to contribute valuable insights into the intricate dynamics between digital skills, encountered

problems, and internet purchasing behavior across diverse geographical and cultural contexts.

The findings of this study will offer valuable insights and will contribute to both practical applications and theoretical frameworks by offering insights into how digital skills and challenges faced impact online purchasing behavior in the European context.

The remainder of the paper is organized as follows. Section 2 presents the literature review. Section 3 explains data collection and methodology. Section 4 provides empirical analyses. The last section offers concluding remarks.

1. LITERATURE REVIEW

Digital skills, encompassing the ability to use and navigate digital technologies effectively, play a pivotal role in shaping consumers' experiences and behaviors in online shopping environments (Van Deursen and Van Dijk 2011). Research indicates that individuals with higher digital skills are more likely to engage in online transactions, navigate e-commerce platforms with ease, and effectively utilize digital tools for product research and comparison (Hargittai 2010). Digital skills contribute to increased online purchasing by fostering a sense of empowerment and confidence among users (Correa et al. 2010). Individuals proficient in digital skills are better equipped to overcome barriers related to technology use, enhancing their overall online shopping experience (Molla and Licker 2005). Moreover, digital skills enable consumers to critically assess online information, make informed decisions, and utilize online security features, thereby mitigating potential risks associated with online transactions (Castells 2001). The digital divide, characterized by discrepancies in digital skill levels across demographic groups, highlights the importance of addressing digital literacy as a means to promote inclusive and equitable participation in online commerce (Warschauer 2003). Therefore, understanding the role of digital skills in the online purchasing process is crucial for businesses, policymakers, and educators to develop interventions that enhance digital literacy and bridge existing gaps, ensuring that a broad spectrum of consumers can fully benefit from the opportunities provided by e-commerce platforms.

The quality of delivery services plays a crucial role in shaping the overall online shopping experience for consumers. Timely and reliable delivery is often associated with increased customer satisfaction and loyalty (Büyükoğkan et al. 2019). Studies have highlighted the importance of factors such as accurate delivery time estimates, transparent tracking systems, and hassle-free return processes in influencing customer perceptions of delivery quality (Li and Zhang 2020). On the contrary, delays, incorrect deliveries, or damaged goods during the delivery process can lead to negative customer experiences (Wang and Emurian 2005). E-commerce companies deploy approaches to rapidly expand their reach, addressing issues such as elevated transaction costs, diverse consumer preferences, and the enduring significance of small and medium-sized retail enterprises (Reardon et al. 2021).

The receipt of damaged products is a common concern for online shoppers and can result in dissatisfaction and negative reviews. Studies have investigated the causes of product damage during shipping, including inadequate packaging, mishandling by logistics providers, and poor-quality control processes (Bai and Sarkis 2018). Research suggests that transparent communication about product conditions, improved packaging practices, and effective return policies contribute to reducing the incidence of damaged products and enhancing customer satisfaction (Roggeveen et al. 2020).

The phenomenon of consumers incurring higher costs than initially expected during online shopping has been explored in the literature. Unanticipated expenses may arise from hidden fees, unclear pricing structures, or unexpected charges during the checkout process (Liang and Huang 1998). The research underscores the importance of transparent pricing, comprehensive disclosure of additional costs, and simplified checkout processes to manage customer expectations and reduce the likelihood of perceived cost surprises (Kim et al. 2016).

E-commerce platforms are susceptible to various forms of fraud, including identity theft, payment fraud, and deceptive product listings. Fraudulent activities can undermine consumer trust in online shopping platforms and hinder the growth of e-commerce (Ratten 2019). Research has explored the impact of fraud prevention measures, such as secure payment gateways, authentication protocols, and user education, in mitigating the risks associated with online fraud (Bock et al. 2019). Understanding consumer perceptions and concerns related to fraud is essential for designing effective countermeasures (Suh and Han 2002).

The quality of a website is a critical factor influencing the online shopping experience. Studies have explored the impact of website design, navigation, and user interface on consumer satisfaction and trust (Flavián et al. 2006). A visually appealing and user-friendly website enhances the overall online shopping experience, reduces cognitive load, and positively influences consumer perceptions of reliability and credibility (Cyr et al. 2007). Conversely, poor web page quality may lead to user frustration, decreased trust, and abandoned shopping carts (Zhang et al. 2017). The availability and accessibility of a diverse range of online retailers contribute to the attractiveness of the e-commerce landscape (Li and Suomi 2009). Research has investigated the factors influencing consumers' choices of online retailers, including product variety, price competitiveness, reputation, and convenience (Kim et al. 2009). Understanding the dynamics that influence the decision to buy from specific online retailers is crucial for businesses to tailor their strategies and offerings to meet consumer preferences and expectations.

3. DATA COLLECTION AND METHODOLOGY

The research employs a quantitative approach and utilizes a Eurostat data source that provides a comprehensive dataset that captures various aspects of digital behavior and online transactions within the Europe. All variables are expressed as percentages, including the percentage of individuals who made their most recent orders within the past 3 months relative to the population aged 16-74 that used the Internet in the last year. Similarly, it encompasses the percentage of individuals facing problems in online purchasing in the last 3 months compared to the total number of online orders placed, or the level of digital skills as a percentage of individuals who used the internet in the last 3 months. These data points relate to the populations of 36 European states, and the information was sourced from the Eurostat website, specifically referencing the year 2021.

The quantitative analysis incorporates 12 coded variables, each playing a distinct role in the dynamics of online purchasing. At the core of our investigation is the main variable "Internet Purchase in the Last 3 Months," representing the percentage of individuals who utilized the Internet within the preceding year. This key metric provides a detailed

snapshot of recent e-buying patterns, facilitating a nuanced exploration of online consumer behavior within EU member states.

An indispensable aspect of our study revolves around assessing individuals' proficiency in digital skills, a critical determinant in the landscape of internet-based transactions. The variable "Digital Skills (Basic or Above)" scrutinizes respondents' digital capabilities, discerning whether they possess fundamental or advanced skills. This evaluation is paramount for comprehending the influence of digital proficiency on online purchasing behaviors. The digital skills indicators, composite metrics based on specific internet- or software-related activities performed by individuals aged 16-74, encompass four key areas: information, communication, problem-solving, and software skills. These indicators, acting as proxies for individuals' digital competencies, are assumed to reflect their corresponding skills (Eurostat 2021c).

Additionally, our study focuses on variables addressing problems encountered during internet purchasing. These encompass a spectrum of challenges, including delivery delays, unforeseen costs, receipt of incorrect or damaged goods/services, issues with fraud, complications in redress procedures, concerns about website usability, limitations with foreign retailers, and difficulties obtaining information on guarantees and legal rights. All variables, codes, and their respective explanations are detailed in the following list:

1. **IP_3M:** Internet Purchase in the Last 3 Months as a % of individuals who used the Internet within the last year (Eurostat 2021).
2. **DS_Basic/Above:** Individuals with basic or above basic overall digital skills (all five component indicators are at basic or above basic level) as a % of individuals who used the internet in the last 3 months (Eurostat 2021b).
3. **PD_Slower:** Speed of Delivery Slower than Indicated
4. **PD_Costs:** Final Costs Higher than Indicated
5. **PD_Wrong/Damaged:** Wrong or Damaged Goods/Services Delivered
6. **PD_Fraud:** Problems with Fraud
7. **PD_Complaints:** Complaints and Redress Difficult or No Satisfactory Response after Complaint
8. **PD_Website:** Website Too Difficult to Use or Worked Unsatisfactorily
9. **PD_ForeignRetailer:** Foreign Retailer Did Not Sell in My Country
10. **PD_Guarantees:** Difficulties Finding Information Concerning Guarantees, Other Legal Rights
11. **IP_WithProblems:** Individuals Who Encountered Problems when Buying via a Website or an App (3 Months) for Private Use
12. **IP_NoProblems:** Individuals Who Did Not Encounter Problems when Buying via a Website or an App (3 Months) for Private Use (Eurostat 2021a)

Descriptive statistics is employed to provide an overview of these variables that contribute to a comprehensive exploration of the various aspects influencing online purchasing behaviors, encompassing digital skills, challenges faced, and overall consumer experiences in the digital marketplace. This includes calculating means, and standard deviations to identify central tendencies and variations. Pearson correlation is employed as well as a statistical measure that quantifies the linear relationship between two variables. It assesses the strength and direction of the linear association between the variables. The correlation coefficient takes values between -1 and 1. We aim to investigate the influence of digital skills on internet purchasing and its role in the absence of reported problems among online shoppers. This study employs regression analysis to

examine the interplay between the main variable (internet purchase) and the independent variable (digital skills), exploring how digital skills contribute to both internet purchasing behavior and the likelihood of not reporting problems during the online shopping process.

4. RESULTS

Table 1 presents descriptive statistics for key variables in this study. The main variable, "Internet purchase in the last 3 months as a percentage of internet users in the last 12 months," exhibits variability, ranging from 11.92% in Albania to 87.44% in the Netherlands, with a mean of 57.8% and a standard deviation of 19.34.

The variable related to individuals with basic or above digital skills, expressed as a percentage of internet users in the last 3 months, reveals a minimum of 29.98% in Albania and a maximum of 60.82% in the Netherlands, with a mean of 60.82% and a standard deviation of 13.9. Examining problems encountered during internet purchasing, the percentage of complainants about the speed of delivery ranges from 2.36% in Bosnia and Herzegovina to 50.72% in Norway. Those reporting higher costs than indicated vary from 0.17% in Serbia to 22.7% in Iceland. Reports of wrong or damaged products range from 2.5% in Albania to 14.9% in Norway. Fraud complaints are the least frequent in Albania at 0.17% and highest in Croatia at 6.43%. For complaints about difficulties finding information concerning guarantees and other legal rights, percentages range from 0.45% in Greece to 17.3% in Norway. Individuals reporting complaints and redress difficulties vary from 0.3% in Cyprus to 12.98% in the Netherlands. The percentage of internet shoppers indicating that the website was too difficult to use or worked unsatisfactorily ranges from 0.38% in North Macedonia to 27.47% in Norway. Concerns about foreign retailers not selling in one's country range from 0.38% in North Macedonia to 44.10% in Iceland. Finally, the percentage of individuals who did not encounter problems when buying via a website or an app for private use in the last 3 months varies from 28.45% in Norway to a maximum of 93.34% in Portugal.

Table 1. Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
1. IP_3M	36	11.92	87.44	57.7717	19.33686
2. DS_Basic/Above	36	29.98	83.52	60.8158	13.86790
3. PD_Slower	36	2.36	50.72	19.8844	11.59213
4. PD_Costs	36	0.19	22.70	3.9011	4.60840
5. PD_Wrong-Damaged	36	2.50	14.90	7.0964	3.56799
6. PD_Fraud	36	0.17	6.43	2.2778	1.64422
7. PD_Complaints	36	0.30	12.98	4.0217	2.97052
8. PD_Website	36	0.38	27.47	8.3111	6.31013
9. PD_ForeignRetailer	35	0.38	44.10	9.2077	12.19580
10. PD_Guarantees	36	0.45	17.30	5.3864	4.08250
11. IP_NoProblems	36	28.45	93.34	64.7636	17.17244

Source: Eurostat

Pearson correlation analysis was conducted to examine the associations among the variables, and the outcomes are detailed in Table 2. When considering variables representing encountered problems as a percentage of individuals engaged in online purchasing during the same period, substantial and statistically significant correlation coefficients between the variables are observed. The analysis indicates that internet purchasing holds statistical significance at the 1% level, displaying correlations with

digital skills, delayed delivery, and challenges related to website usability. More specifically, digital skills exhibit notable statistical significance at the 1% level, displaying a correlation coefficient surpassing 0.6 concerning delayed delivery, issues with fraud, and challenges in redress procedures. An interesting finding is that the variable indicating delays in delivery demonstrates statistically significant correlations at the 1% significance level with all variables. Furthermore, higher final costs than indicated are statistically significant and correlate with challenges in finding information about guarantees and legal rights, while showing a negative correlation with the absence of encountered problems. Importantly, all other variables reveal statistically significant negative correlations with the absence of reported problems.

Table 2. Pearson Correlations

	1	2	3	4	5	6	7	8	9	10	11
1	1										
2	.76**	1									
3	.64**	.62**	1								
4	.33*	.44**	.66**	1							
5	.55**	.43**	.81**	.52**	1						
6	.47**	.64**	.71**	.52**	.74**	1					
7	.57**	.65**	.81**	.56**	.81**	.78**	1				
8	.66**	.59**	.82**	.56**	.81**	.73**	.78**	1			
9	.35*	.48**	.66**	.78**	.54*	.47**	.52**	.48**	1		
10	.44**	.47**	.78**	.52**	.77**	.69**	.81**	.85**	.4*	1	
11	-.55**	-.59**	-.89**	-.73**	-.79**	-.66**	-.73**	-.79**	-.78**	-.74**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed), *. Correlation is significant at the 0.05 level (2-tailed). Source: Eurostat

Figure 1 illustrates internet purchasing, digital skills, and the absence of encountered problems by internet purchasers in the last 3 months, it is evident that individuals who reported the highest percentage of not encountering any problems also demonstrated the lowest purchasing activity and lower level of digital skills.

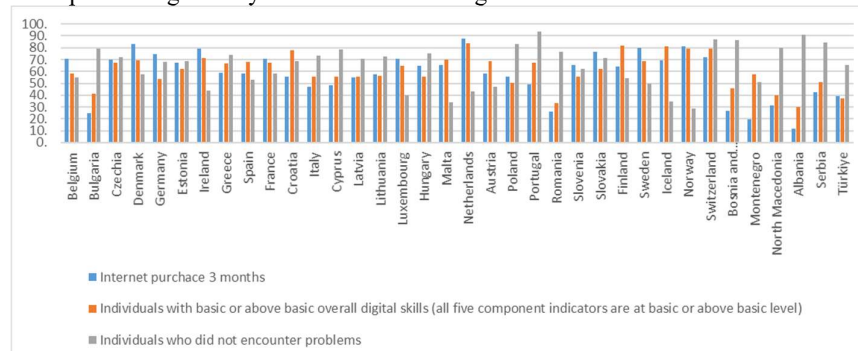


Figure 1. Internet purchasing, Digital skills and No encountered problems
Source: Eurostat

Based on the descriptive statistics, correlation analysis, and graphic presentation that show strong relationship, additionally, regression analyses is performed addressing the research questions: RQ1: What is the impact of digital skills on individuals' likelihood to participate in internet purchasing? RQ2: Do individuals with lower levels of digital skills, engaged in internet purchasing, report fewer problems during online shopping?

The results of performed regression analysis between online purchases encountered problems and the level of digital skills indicate that the independent variables account for a substantial portion of the variance in the dependent variable, with an R-squared value of 0.614. The analysis of variance (ANOVA) further supports the significance of the model, revealing an F-statistic of 54.057 with a p-value of 0.0000. Regression results presented in Table 4, show a beta coefficient of 1.030, being statistically significant at the 1% significance level, meaning, for a one-unit increase in digital skills, there is a 1.030-unit increase in internet purchasing. This positive beta coefficient suggests a proportional and positive relationship between digital skills and internet purchasing, emphasizing that as individuals' digital skills increase, their likelihood of engaging in internet purchasing also increases. Practically, this finding implies that interventions aimed at enhancing digital skills could contribute to a corresponding increase in internet purchasing behavior. This aligns with the notion that a more digitally literate population is more likely to participate in online transactions. This insight can guide strategic decisions for businesses and policymakers looking to leverage digital literacy to foster e-commerce engagement.

Table 3. Regression results: Last online purchase: in the last 3 months as a % of individuals who used the internet within the last year as a dependent variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DS_Basic/Above	1.030	0.140	7.352	0.000
C	6.666	8.733	0.763	0.45

Source: Authors' calculations

The outcomes of the conducted regression analysis between individuals who did not encounter problems and the level of digital skills reveal that the independent variables contribute significantly to the variability in the dependent variable, as evidenced by an R-squared value of 0.348. The analysis of variance (ANOVA) supports the model's significance, with an F-statistic of 18.157 and a p-value of 0.0000. Highlighted in Table 4, the beta coefficient of -0.731, is statistically significant at the 1% level. Given the negative beta coefficient of -0.731 for the variable "Individuals who did not encounter problems as a percentage of internet purchasers" regressed on "Individuals with basic or above basic overall digital skills," this means that for every one-unit increase in digital skills, the percentage of individuals who did not encounter problems during internet purchasing is expected to decrease by 0.731 units. This implies a proportional decrease in the likelihood of individuals reporting no problems during online transactions as their digital skills increase. In essence, individuals with higher digital skills are associated with a lower likelihood of reporting no problems during internet purchasing, as indicated by the negative beta coefficient.

Table 4. Individuals Who Did Not Encounter Problems when Buying via a Website or an App (3 Months) for Private as a dependent variable

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DS_Basic/Above	-0.731	0.171	-4.261	0.000
C	109.196	10.688	10.217	0.000

Source: Authors' calculations

CONCLUSION

This study has explored the intricate relationship between digital skills, internet purchasing behavior, and the reporting of encountered problems during online transactions across 36 European countries. The findings shed light on the multifaceted dynamics that shape consumers' engagement with e-commerce platforms. The quantitative analysis, utilizing data from Eurostat for the year 2021, has unveiled compelling insights. Firstly, a higher level of digital skills is positively correlated with increased internet purchasing. Individuals equipped with advanced digital competencies exhibit a greater propensity to engage in online transactions, underscoring the pivotal role of digital proficiency in shaping contemporary consumer behavior. Furthermore, our study delved into the reporting of problems during online shopping experiences. Intriguingly, we observed that individuals with lower digital skills are more inclined to refrain from reporting problems encountered during internet purchasing. This suggests a nuanced relationship between digital skills and the articulation of challenges faced in the online shopping process. Moreover, those with advanced digital skills are more likely to report problems encountered during online shopping.

These findings carry significant implications for both practitioners and policymakers. Recognizing the positive influence of digital skills on internet purchasing, businesses can prioritize initiatives that enhance consumers' digital literacy. Moreover, strategies aimed at fostering a user-friendly and secure online environment could contribute to a more positive online shopping experience.

In conclusion, our research contributes valuable insights into the pivotal role of digital skills in shaping the e-commerce landscape. As digital technologies continue to evolve, understanding the nuanced connections between digital proficiency, online purchasing behavior, and problem reporting becomes essential for cultivating a resilient and consumer-centric e-commerce ecosystem. This study provides a foundation for future research endeavors and practical interventions aimed at optimizing the digital consumer experience.

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