

Understanding Technology Overdependence Through the Lens of E-Competency and Digital Resiliency Among Junior High School Learners

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Abstract

This study looks at how junior high students' digital resilience, e-competence, and over-reliance on technology are related to one another. The results show that there are moderate to strong positive relationships between these constructs, meaning that the more students use technology to help them with self-regulation and emotional coping, the more resilient and digitally confident they are. E-competence is a significant predictor of technology overdependence, according to the regression analyses, and this predictive power increases when digital resilience is included. These results highlight the fine line that must be drawn between developing digital skills and controlling excessive technology use.

This research sheds light on how blending technical skills with emotional resilience can lead to healthier interactions with technology. It backs up educational and organizational approaches that weave together digital literacy and psychosocial support to help mitigate the risks of overdependence. With insights drawn from the changes brought on by the COVID-19 pandemic, this framework highlights the importance of digital competency for achieving educational success, workplace efficiency, and mental health. The recommendations include revamping curricula to include digital resilience education, implementing workplace policies that promote digital well-being, and designing technology that empowers users to take control. Future research should focus on long-term studies, culturally aware interventions, and AI-driven adaptive tools to tailor digital usage management to individual needs.

Keywords: E-competency, Digital Resilience, Technology Overdependence, Digital Literacy, Emotional Self-Regulation, Educational Interventions, Digital Well-being, Technology Use Behavior

1. Introduction

Technology has woven itself into the fabric of our everyday lives, especially for young learners navigating the digital landscape. Junior high school students are turning to digital tools more than ever for their education, communication, and entertainment. While these technologies can make learning more accessible and engaging, relying too heavily on them can create some serious challenges. This overreliance can take a toll on students' academic performance, social skills, and mental health, leading to problems like diminished creativity, shorter attention spans, and feelings of social isolation.

Recent studies have raised alarms about how much students are leaning on technology. Research from the Philippines and around the world shows that spending too much time in front of screens and having unregulated digital habits can lead to serious mental health issues, like anxiety and depression. Even though we've made strides with digital literacy programs, there's still a noticeable gap in understanding how students' digital skills and their ability to bounce back from challenges affect how they use technology.

DepEd Order No. 83, s. The Department of Education (DepEd) in the Philippines issued an order that prohibits using a cell phone in class. 2003, which reiterates the ban on students using cell phones and pagers in class. This order has been reinforced by a number of later directives, including those issued by regional offices in response to recurring issues like inattention and cheating. DECS (Department of Education, Culture and Sports, this was renamed Department of Education) Order Nos. 70, s. is reiterated in this order. 26 s. and 1999. 2000, which expressly forbade elementary and secondary school pupils from using cell phones in class. Because indecent and filthy photo messages were so common and because activities like texting, gaming, and viewing films were disrupting classrooms, the ban was put into place. As seen by the March 2024 letter from the DepEd National Capital Region (NCR), which advises school heads to keep an eye on compliance with the ban, regional and local memorandums continue to support this policy.

The researcher conducted interviews with several learners to explore how they incorporate technology into their daily lives across both academic and personal contexts. The majority of participants reported using technology primarily for school-related activities such as conducting research, collaborating with peers, attending virtual classes, and organizing their assignments and schedules. Outside of school, technology use was predominantly centered around social media platforms, which learners relied on for entertainment and maintaining connections with friends and family through chatting and social interaction.

When asked about their experiences with prolonged use of digital devices, many learners disclosed experiencing physical symptoms such as eye strain, headaches, and musculoskeletal stiffness, which often led to increased irritability. In addition to physical discomfort, mental fatigue was a common consequence, with learners describing feelings of cognitive drain, diminished concentration, and difficulty maintaining focus following extended screen time.

Regarding their challenges in reducing technology use, participants expressed difficulty in disconnecting from their devices. They highlighted an urge to constantly check for new messages or updates and feelings of boredom or restlessness when separated from their screens. For most, technology use has become an ingrained habit, making behavioral change particularly challenging.

To cope with stress, distractions, or interruptions caused by technology, learners reported employing various strategies. These included taking periodic breaks to rest their eyes and minds, engaging in offline activities such as spending quality time with family, listening to music, and consciously prioritizing important tasks while minimizing potential distractions. These coping mechanisms reflect an emerging awareness among learners of the need for balance and self-regulation in managing their technology use.

This study examines the impact of e-competency—the ability to navigate digital technology—and digital resiliency effectively—the capacity to adapt and manage digital challenges—on technology overdependence among junior high school students. Understanding these factors is crucial for grasping both the positive and negative impacts of technology use.

The goal of this research is to gather real-world evidence on how digital skills and resilience affect students' reliance on technology. This study adds to the current understanding by examining how these elements interact specifically in the context of junior high schools in the Philippines. The findings are intended to guide educators, school leaders, and policymakers in creating strategies that encourage a balanced and healthy approach to technology use among young people, ensuring they can enjoy the advantages of digital tools while reducing potential risks.

2. Methodology

This study used a descriptive-correlational research design to explore how e-competency and digital resiliency affect technology overdependence among junior high school students. The participants were 269 students from Grades 7 to 10 at Catumbalon National High School in the Philippines. To ensure a diverse sample that represented different grade levels and genders, the researchers employed a stratified random sampling technique.

Data collection involved three validated Likert-scale questionnaires that measured e-competency, digital resiliency, and technology overdependence. The e-competency scale evaluated the students' digital skills and knowledge, while the digital resiliency scale assessed their ability to adapt and handle online challenges. The technology overdependence scale looked at how much they relied on digital technologies.

For data analysis, descriptive statistics were used to outline the levels of the variables, Pearson's correlation helped identify relationships between e-competency, digital resiliency, and technology overdependence, and multiple regression analysis was conducted to evaluate the combined impact of e-competency and digital resiliency on technology overdependence. A statistical significance level was set at $p < 0.05$.

3. Results and Discussion

Table 1: Level of E-Competency among Junior High School learners

E-Competency	Mean	Qualitative Interpretation
Technical Skills	3.43	Moderately E-competent
Information Literacy	3.50	Moderately E-competent
Overall mean	3.46	Moderately E-competent

Legend:

Mean Interval	Descriptive Rating	Qualitative Interpretation
4.51 - 5.00	Strongly Agree	Highly E-competent
3.51 - 4.50	Agree	E-competent
2.51 - 3.50	Neutral	Moderately E-competent
1.51 - 2.50	Disagree	Low E-competent
1.0 - 1.50	Strongly Disagree	Very Low E-competent

The table shows that the average scores for participants in both Technical Skills (3.43) and Information Literacy (3.50) are in the "Moderately E-competent" range, with an overall average of 3.46. This indicates a moderate level of electronic competency. It suggests that while the

respondents have decent technical skills and information literacy, there's still a significant opportunity for growth in their digital competencies.

These results align with recent studies that point out that moderate e-competency is common among students and professionals, particularly in environments where digital literacy training isn't fully implemented or standardized (Casas-Puente et al., 2025). The moderate level of technical skills reflects the challenges noted in workforce adaptability research, where a lack of structured digital literacy and competency standards can impede optimal performance (Edunity, 2025). Likewise, the moderate information literacy level highlights global concerns about the necessity for better critical evaluation and responsible use of digital information among learners (Academic-Publishing, 2025).

Research conducted locally on Technology and Livelihood Education (TLE) teachers in the Philippines supports these findings, revealing that while there's a strong competence in certain areas, there are noticeable gaps in critical and innovative thinking skills related to digital literacy (Sajode & Abrea, 2025). Additionally, work immersion programs indicate that students show a moderate level of readiness in computer literacy, highlighting some shortcomings in their ability to apply digital skills in real-world situations (Scimatic, 2025).

International systematic reviews highlight key factors like access, gender, self-efficacy, and educational support that play a significant role in shaping digital skill levels. These factors are closely linked to the moderate competency levels shown in the table (Kakaei & Sa'adatmand, 2019; Frontiers, 2025). There's a clear need for targeted digital literacy programs that focus on both technical skills and information literacy to help boost e-competency from moderate to high.

This analysis points to the importance of structured digital literacy initiatives, hands-on experience, and training in critical information management to enhance e-competency comprehensively, in line with both international and local academic recommendations.

Table 2: Level of Digital Resiliency among Junior High School learners

Digital Resiliency	Mean	Qualitative Interpretation
Self-Regulation	3.60	Digitally resilient
Emotional Resilience	3.54	Digitally resilient
Overall mean	3.57	Digitally resilient

Legend:

Mean Interval	Descriptive Rating	Qualitative Interpretation
4.51 - 5.00	Strongly Agree	Highly digital resilient
3.51 - 4.50	Agree	Digitally resilient
2.51 - 3.50	Neutral	Moderately digital resilient
1.51 - 2.50	Disagree	Low digital resilience
2.0 1.50	Strongly Disagree	Very Low digital resilience

The table on digital resiliency reveals mean scores of 3.60 for Self-Regulation and 3.54 for Emotional Resilience, leading to an overall mean of 3.57, all neatly fitting into the "Digitally resilient" category. This suggests that the respondents have a solid knack for adapting and managing their emotions in digital environments, which helps them tackle digital challenges and stresses effectively.

Usar and Moskalova (2025) talk about digital resilience in teenagers as their ability to turn online challenges into growth opportunities, such as building emotional stability and self-

confidence. They highlight how crucial self-regulation is in this journey. Likewise, other research points out how adaptable digital resilience is when it comes to handling the changes in our digital world and keeping a healthy mindset, especially when faced with academic and social pressures (Fakhruddin et al., 2025; Behrendt et al., 2023).

Research shows that models combining social learning theory with digital transformation can significantly boost student resilience and mental health, especially in high-pressure areas like Jakarta and West Java. This highlights just how crucial emotional resilience is (Saputra et al., 2025). Additionally, digital resilience is closely tied to lifelong learning and effective coping strategies for dealing with digital disruptions, which helps create a dynamic and adaptable learning environment (Flanagan et al., 2024).

The moderate to strong digital resilience highlighted in the table reflects both global and local research trends that stress the importance of self-regulation and emotional regulation as key elements. These skills are essential for students and professionals to succeed in our increasingly digital landscape, pointing to the ongoing necessity for educational programs and tech support systems that foster and maintain digital resilience.

Table 3: Level of Technology overdependence among Junior High School learners

Technology Overdependence	Mean	Qualitative Interpretation
Compulsive Use	3.46	Moderately technology overdependent
Social Impacts	3.42	Moderately technology overdependent
Overall mean	3.44	Moderately technology overdependent

Legend:

Mean Interval	Descriptive Rating	Qualitative Interpretation
4.51 - 5.00	Strongly Agree	Highly technological overdependence
3.51 - 4.50	Agree	Technology overdependent
2.51 - 3.50	Neutral	Moderately technology overdependent
1.51 - 2.50	Disagree	Low technology overdependence
3.0 1.50	Strongly Disagree	Very Low technology overdependence

The table detailing technology overdependence reveals that respondents scored an average of 3.46 for Compulsive Use and 3.42 for Social Impacts, leading to an overall mean score of 3.44. This is interpreted as "Moderately technology overdependent." Essentially, this suggests that people are somewhat reliant on their digital devices and technology, which could result in compulsive behaviors and noticeable social consequences, but it doesn't seem to reach an overly concerning level.

Research shows that excessive use of technology often ties back to various psychosocial factors. The social consequences can include fewer face-to-face interactions and a rise in digital distractions (Pan et al., 2025; Wahyuni et al., 2023). On a local level, the role of parents and teachers in guiding young children's technology use is vital for developing healthy digital habits and preventing early overreliance (Nurhidayati & Hartono, 2025). In workplace settings, studies highlight the issue of technology overload, pointing out that implementing strategies like training and effective time management is key to countering negative impacts and keeping productivity on track (Ghosh & Das, 2022).

The impact of technology overuse on mental health, particularly among teens and young adults, has become a significant area of concern. Studies have shown a connection between excessive reliance on technology and increased risks of anxiety and depression, underscoring the urgent

need for preventive measures (Smith & Lee, 2024). While technology certainly offers educational and social advantages, the moderate overuse highlighted in this table emphasizes the necessity for a balanced approach and initiatives aimed at promoting digital well-being.

To tackle the issue of moderate technology overdependence effectively, it's suggested that we combine efforts from educational policies, parental guidance, and workplace strategies.

Table 4: Overall mean of e-competency, digital resiliency, and technology overdependence among Junior High learners

	E-Competency	Digital Resiliency	Technology Overdependence
Mean	3.4694	3.5719	3.4454

The table showcases some descriptive statistics for three key variables: E-Competency, Digital Resiliency, and Technology Overdependence, all based on 269 valid responses. The average scores reveal that respondents generally feel moderately positive about their digital skills and adaptability, with E-Competency sitting at an overall mean of 3.47, Digital Resiliency at 3.57, and Technology Overdependence at 3.44. The medians and modes indicate that the central tendencies are a bit higher for Digital Resiliency and Technology Overdependence, suggesting that people see themselves as fairly digitally resilient but also somewhat reliant on technology. The standard deviations and ranges show a moderate level of variability in the responses.

These statistics resonate with international research that highlights the delicate balance people strike between digital skills, adaptability, and the dangers of becoming too reliant on technology. Studies indicate that having a moderate level of E-Competency helps individuals navigate digital spaces effectively, but it's essential to keep honing these skills to keep up with changing demands (Ayed, 2022; Casas-Puente et al., 2025). Digital Resiliency plays a vital role in managing digital stress and supporting mental health; self-regulation and emotional strength are crucial factors that boost how well individuals adapt in digital settings (Usar & Moskalova, 2025; Fakhruddin et al., 2025). At the same time, a moderate level of Technology Overdependence reflects typical behaviors influenced by constant access to devices, but it also raises important issues about compulsive usage and its social effects, highlighting the need for balanced digital habits and supportive educational systems (Pan et al., 2025; Ghosh & Das, 2022).

The combined insights underscore the necessity of well-rounded digital literacy programs that not only build technical skills but also foster emotional and behavioral regulation, ultimately enhancing digital engagement while reducing the risks of overdependence.

Table 5: Correlation among e-competency, digital resiliency, and technology overdependence among Junior High learners

Variables	E-competency	Digital Resiliency	Technology Overdependence
E-competency	1	.743**	.657**
Digital Resiliency	.743**	1	.624**
Technology Overdependence	.657**	.624**	1

** indicates significance at the 0.01 level (2-tailed); N=269.

The correlation table shows some strong and significant positive relationships among E-Competency, Digital Resiliency, and Technology Overdependence at the 0.01 level. The Pearson correlation between E-Competency and Digital Resiliency is quite high at .743, which means that people who are more digitally competent tend to show greater digital resilience. In a similar vein, E-Competency also has a positive correlation with Technology Overdependence at .657, implying that those with better digital skills might rely more on technology. Additionally, Digital Resiliency has a significant correlation with Technology Overdependence at .624, suggesting that even emotionally stable and self-regulated individuals can still find themselves moderately dependent on technology.

This interaction aligns with research indicating that improved digital skills not only help people adapt and build emotional resilience against digital challenges but can also lead to a greater engagement with technology, which sometimes results in overdependence (Casas-Puente et al., 2025; Usar & Moskalova, 2025). Studies on digital self-efficacy highlight that when individuals feel more competent, it boosts their confidence and resilience in digital spaces, but it also requires careful management to avoid compulsive usage (Frontiers, 2025). Additionally, research suggests that balanced digital literacy programs are essential; they should enhance skills and resilience while also addressing the risks of addiction through education and psychosocial support (Ayed, 2022; Ghosh & Das, 2022).

This table showcases the strong positive connections between the three concepts, showing that a higher level of e-competency is closely linked to increased digital resilience and a moderate rise in technology overdependence. It underscores how digital skills, adaptive resilience, and technology usage are all interconnected, highlighting the need to strike a balance between being digitally proficient and engaging with technology mindfully.

Correlation matrices can be incredibly helpful for interpreting research and guiding policies or educational strategies aimed at promoting healthy digital habits while also building skills and resilience.

Table 6: Multiple regression summary table

Model	Predictors	R	R square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	(constant), E-competency	.657	.432	.429	.40733	
2	(constant), E-competency, Digital resiliency	.688	.473	.469	.39304	1.847

The summary table reveals that E-Competency alone accounts for 43.2% of the variance in Technology Overdependence, as indicated by an R Square value of .432. When we include Digital Resiliency as an additional predictor, this explained variance rises to 47.3%. The adjusted R Square values take into consideration the number of predictors, confirming that the improvement in the model is solid. Additionally, the Durbin-Watson value, which is close to 2, suggests there's no autocorrelation issue in the residuals, pointing to a well-fitting model.

These findings highlight the intricate nature of our digital behaviors. It turns out that having strong E-Competency—essentially, our digital skills and literacy—tends to go hand in hand with a greater reliance on technology. However, when we factor in Digital Resiliency, which

includes emotional and self-regulation skills, we see a clearer picture. This resilience seems to help counteract the tendency to overuse technology (Ayed, 2022; Usar & Moskalova, 2025). Previous research has pointed out that while being digitally competent can lead to more effective technology use, it can also make users more vulnerable to overdependence if they lack resilience (Ghosh & Das, 2022). This model supports the idea that combining digital literacy with resilience training can help curb compulsive tech use while still maintaining our skills (Casas-Puente et al., 2025; Frontiers, 2025).

This regression analysis indicates that both E-Competency and Digital Resiliency play a significant role in predicting Technology Overdependence. Their combined influence does a better job of explaining the variations in overdependence behavior. This finding aligns with previous research that highlights the need to strike a balance between digital skills and resilience-building to effectively manage technology use (Ayed, 2022; Usar & Moskalova, 2025).

Table 7: Multiple regression coefficient

Model	Predictor	B	Std. Error	Beta	t	Sig.	95% Confidence Interval for B	Zero-order Correlation	Partial Correlation	Part Correlation	Tolerance	VIF
1	Constant	0.855	0.184		4.659	0.000	0.494 to 1.217					
	E-Competency	0.747	0.052	0.657	14.239	0.000	0.643 to 0.850	0.657	0.657	0.657	1.000	1.000
2	Constant	0.673	0.182		3.708	0.000	0.316 to 1.031					
	E-Competency	0.490	0.076	0.431	6.481	0.000	0.341 to 0.639	0.657	0.369	0.289	0.447	2.236
	Digital Resiliency	0.300	0.066	0.303	4.557	0.000	0.170 to 0.429	0.624	0.269	0.203	0.447	2.236

B = Unstandardized Coefficient, Beta = Standardized Coefficient, t = t-statistic, Sig. = Significance (p-value), Tolerance, and VIF assess collinearity; Values within acceptable ranges indicate no severe multicollinearity.

The regression coefficients table gives us a detailed look at how E-Competency and Digital Resiliency impact Technology Overdependence. In Model 1, E-Competency stands out with a significant positive effect ($B = 0.747$, $\beta = 0.657$, $p < 0.001$). This means that for every one-unit increase in E-Competency, Technology Overdependence rises by 0.747 units. The strong beta coefficient really emphasizes E-Competency as a key predictor. When we bring Digital Resiliency into the mix in Model 2, both factors still show significance. E-Competency's influence dips a bit ($B = 0.490$, $\beta = 0.431$, $p < 0.001$), but Digital Resiliency also makes a positive contribution to Technology Overdependence ($B = 0.300$, $\beta = 0.303$, $p < 0.001$). This indicates that while E-Competency has the most substantial unique impact, Digital Resiliency adds extra value to the variance in Technology Overdependence. The collinearity statistics (Tolerance = 0.447; VIF = 2.236) suggest that multicollinearity is at an acceptable level, reinforcing the reliability of the model.

These findings are in line with research indicating that having stronger digital skills (E-Competency) boosts technology engagement. However, it also raises the risk of becoming overly dependent if not balanced out by emotional and self-regulatory skills (Digital Resiliency) (Ayed, 2022; Usar & Moskalova, 2025). Essentially, digital resilience acts as a buffer, helping to regulate how intensely we use technology and reducing the chances of developing negative compulsive behaviors (Ghosh & Das, 2022; Casas-Puente et al., 2025).

4. Conclusion

This research highlights the complex relationship between Digital Resiliency, Technology Overdependence, and E-Competency of the respondents. The results identify that increased digital competency is a strong predictor of technology overdependence; however, when digital resiliency is factored in, this increases the explanatory value of the model, indicating that self-regulatory and emotional skills reduce the aversive consequences of technology overuse. The

strong to moderate correlations highlight that even though digital competence enables individuals to seamlessly navigate digital spaces, emotional regulation and adaptability digitally are key in forestalling compulsive use of technology.

Sustained growth of technical digital competencies in conjunction with resilience-enhancing measures promotes healthier digital use and reduces risks from excessive dependence on technology (Ayed, 2022; Usar & Moskalova, 2025; Ghosh & Das, 2022; Casas-Puente et al., 2025). This highlights the necessity of educational interventions and organizational policies that enhance not only digital literacy but also emotional resilience and self-regulation to provide sustainable and efficient technology use. Future action must focus on the integration of digital competence frameworks with psychosocial assistance to deal with the complex issues of technology overdependence.

This comprehensive approach will better prepare individuals to thrive in increasingly digital societies while maintaining psychological well-being and productivity.

5. Recommendation and Implication

Schools need to integrate balanced digital literacy programs that build not only technical competencies but also emotional control and adaptive resilience. Such a balanced approach will enable students to derive maximum benefits from technology while coping with probable psychological hazards (Ayed, 2022; Casas-Puente et al., 2025). Parent training and teacher education are essential to ensure healthy screen habits, supervision, and off-screen activities (PMC, 2024).

Technology designers need to focus on ethical design in minimizing addictive aspects and maximizing user autonomy in promoting digital well-being. Work policies should help manage technology overload through supportive practices and developing awareness of digital health (Ghosh & Das, 2022). Governments and health agencies should work together for multi-sectoral interventions, policy guidelines, and affordable mental health care to address problematic technology use as a public health issue (Kuss, 2025).

While this study provides valuable insights into the relationships among e-competency, digital resiliency, and technology overdependence, it is limited by several contextual factors that future research should address. One notable limitation is the relative homogeneity of the sample, which may not fully capture the diversity of cultural and environmental influences on technology use. Culture shapes individual and collective attitudes, behaviors, and values toward technology, influencing how it is adopted, used, and managed (James et al., 2022; Johnson, 2022). For instance, collectivist cultures may emphasize social conformity in technological behaviors, whereas individualistic cultures may foster more autonomous usage patterns (Johnson, 2022; E3S Conf, 2021).

Similarly, environmental contexts, including socioeconomic status, technological infrastructure, educational systems, and community norms, play a significant role in shaping technology use patterns (Kakaei & Sa'adatmand, 2019; PMC, 2019). Access to reliable internet, cultural norms regarding screen time, and community support systems all impact digital behaviors (MDPI, 2022). Such factors can modulate users' digital skills development and resilience, as well as their vulnerability to overdependence. For example, digital inclusion disparities across regions may compound or mitigate risks of compulsive technology use (MDPI, 2022; Frontiers, 2025).

Future studies must investigate longitudinal and scalable interventions, utilize AI-based adaptive instruments for real-time modulation of behavior, and test culturally appropriate methods so that there is equity. Prioritizing digital well-being as a societal value will result in persistent productivity, mental well-being, and prudent technology integration in life. It should also adopt cross-cultural and environmental lenses by incorporating diverse samples and employing mixed-methods designs to contextualize behavioral patterns within sociocultural and ecological frameworks. Qualitative approaches exploring lived experiences across varied cultural settings could deepen understanding of how cultural values, social networks, and environmental supports influence digital behaviors and well-being (PMID, 2024). Additionally, evaluating interventions tailored to cultural nuances and resource environments might improve the effectiveness of efforts aimed at promoting balanced technology use.

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