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RESEARCH

Digital Literacy, Digital Well-Being, and Digital Moral Values Among Syrian Migrant Students: A Structural Equation Model

Mehmet Adıyaman[1] · **Hulusi Geçgel**[1]

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Abstract

This study examines the relationships among Digital Literacy (DL), Digital Well-being (DWb), and Digital Moral Values (DMV) perceptions among Syrian Migrant middle school students in Türkiye. Using a Structural Equation Modeling (SEM) approach, data were collected from 526 students in grades 5–8 at a Migrant camp school located in a city in Eastern of Türkiye during the 2024–2025 academic year. Confirmatory factor analyses demonstrated satisfactory construct validity for the adapted measures used in the study. The structural model results indicated that DL negatively predicted both DWb and DMV, contrary to the expected positive direction. Furthermore, the direct effect of DWb on DMV was not statistically significant, and no mediation effect was observed. These findings suggest that higher DL may heighten students' sensitivity to online risks and ethical challenges, potentially leading to lower scores in perceived well-being and moral values. Consequently, the study highlights that educational programs for migrant students should prioritize not only technical skills but also ethical reflection and digital well-being to foster safer digital integration.

Key Insights What is the Main Issue That the Paper Addresses? This study examines the relationships among Syrian Migrant middle school students' levels of digital literacy, digital wellbeing, and perceptions of moral values in digital environments. Specifically, it tests whether digital wellbeing plays a mediating role in these relationships through structural equation modeling.

What are the Main Insights That the Paper Provides? The findings reveal that, contrary to expectations, digital literacy is negatively associated with both digital wellbeing and perceptions of moral values in digital environments. The mediating role of digital wellbeing was not supported. The results suggest that students with higher digital literacy are more critically aware of online risks and ethical issues, and this heightened awareness may lower their reported wellbeing and moral value perceptions. These findings highlight the need for digital education programs for migrant students to focus not only on technical skills but also on fostering ethical awareness and responsible digital engagement.

Extended author information available on the last page of the article

Keywords Digital literacy · Digital well-being · Moral values · Migrant students · Structural equation modeling

1 Introduction

Armed conflicts, environmental disasters, and economic crises occurring on a global scale have rapidly increased forced migration movements, compelling individuals to leave their places of residence. According to data from the United Nations High Commissioner for Refugees (UNHCR, 2023), as of 2023, the number of forcibly displaced persons worldwide has exceeded 110 million. The civil war that began in Syria in 2011 led to the displacement of millions of people, and by 2025, Türkiye has hosted approximately 3 million Syrians, making it one of the countries with the largest migrant population in the world. Nearly 1 million of this population consists of school-age children (Presidency of Migration Management, 2025). Education plays a central role in both the individual and social integration of this group; however, language barriers, socio-economic disadvantages, and traumatic experiences negatively affect migrant students' participation in the educational process and their academic success (Eker et al., 2023; Dryden-Peterson, 2016).

Migrant children represent a unique demographic whose online interactions are heavily influenced by displacement, structural instability, and a lack of consistent educational resources. Recent scholarship suggests that for refugee youth, digital literacy functions not merely as a technical skill, but as a vital coping strategy for maintaining transnational ties and navigating uncertainty. However, this reliance on digital tools often increases their exposure to online hazards (Rice & Cun, 2023; Capstick, 2025). Consequently, high levels of digital literacy among Syrian migrant children may lead to a heightened sensitivity to digital risks rather than a straightforward improvement in digital well-being or moral perception. This context provides a strong theoretical basis for investigating the relationship between digital literacy, well-being, and moral values in this population, as these dynamics likely diverge significantly from those observed in non-migrant or socioeconomically stable peers.

With the progressive shift of education into digital environments, Digital Literacy (DL) has become a fundamental component of contemporary learning processes (Shehata et al., 2023; Händel et al., 2025). Conceptually, DL is defined as the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers (Gilster, 1997). In recent years, DL has expanded beyond technical skills to encompass higher-order cognitive dimensions such as critical thinking, problem-solving, and ethical awareness (Ng, 2012; Händel et al., 2025; Khalaf, 2025). For migrant students in particular, these skills are crucial for both effective participation in education and broader social integration (Alam & Imran, 2015; Molin-Karakoc, 2025).

For migrant children, these expanded dimensions of digital literacy are not only associated with academic participation but are also closely intertwined with how they evaluate online risks, regulate their digital experiences, and make ethical judgments in digital environments (Livingstone et al., 2018; Pangrazio & Selwyn, 2019). There-

fore, digital literacy may simultaneously shape both digital well-being and moral value perceptions in ways that differ from more stable student populations.

Digital Moral Values (DMV) refer to the ethical standards and norms that guide individuals' behavior and decision-making processes in online environments (Ribble, 2015). Ethical behaviors and moral values in digital environments have become more visible with the widespread use of technology (WHO, 2024; DQ Institute, 2019). However, social media, online games, and digital interaction platforms often bring ethical violations such as cyberbullying, hate speech, privacy breaches, and disinformation (Byrne et al., 2016; Livingstone & Stoilova, 2021). Recent studies emphasize that digital competence must encompass ethical awareness to mitigate these risks. For instance, Shehata et al. (2023) highlighted that a lack of ethical competencies in e-learning environments can lead to significant academic misconduct. Similarly, Händel et al. (2025) found that perceptions of digital ethics vary significantly even among higher education students, underscoring the necessity of targeted educational interventions. Furthermore, the rise of artificial intelligence has introduced new complexities; Khalaf (2024) demonstrated that attitudes toward traditional plagiarism are strong predictors of unethical AI use (aigiarism), suggesting that technical skills alone are insufficient without a strong ethical foundation. In this respect, digital well-being may function not only as an outcome of digital engagement but also as a contextual factor influencing how young users interpret and respond to moral challenges encountered in online environments (Vanden Abeele, 2021; Livingstone & Stoilova, 2021).

In recent years, the concept of Digital Well-being (DWb) has gained increasing attention in the fields of education and psychology. DWb is defined as "the optimal state of health and well-being that each individual is capable of achieving while using digital technologies" (Burr et al., 2020). In educational contexts, this concept is commonly operationalized through dimensions such as emotional regulation, psychological safety, and balanced engagement in digital environments, particularly among children and adolescents. It encompasses both the positive and negative impacts of technology on individuals' perceived quality of life (Vanden Abeele, 2021; McCoy & Marcus-Quinn, 2025). Research has shown that the level of DWb varies depending on factors such as usage duration, type of content, and social context (Przybylski & Weinstein, 2017; Kaur et al., 2016). Particularly in the case of adolescents, DWb has been found to be a determinant of academic achievement, social relationships, and psychological health (OECD, 2021; Stanford Youth Digital Wellbeing, 2025).

While the existing literature has extensively examined digital literacy and ethical behaviors among higher education students and general populations (e.g., Händel et al., 2025; Khalaf, 2024; Shehata et al., 2023), there is a notable scarcity of research focusing on vulnerable groups, particularly refugee children. Although these populations are increasingly exposed to digital environments for education and social integration, little is known about the structural relationships between their digital literacy levels, digital well-being, and digital moral values. Migrant students face both the vulnerabilities associated with forced migration and the opportunities and risks of the digital world. However, the current literature reveals that studies specifically addressing the interrelationships between DL, DWb, and DMV among migrant students remain limited. In particular, no recent empirical research has been identi-

fied in Türkiye that examines these three variables within the framework of Structural Equation Modeling (SEM).

This study aims to investigate the relationships among DL, DWb, and DMV of Syrian migrant middle school students studying in Türkiye. In addition, it seeks to test whether DWb plays a mediating role in the relationship between DL and DMV. Within this scope, the study not only addresses a significant gap in the literature but also aims to provide evidence-based recommendations for policymakers in designing digital citizenship, ethical awareness, and digital well-being programs tailored for migrant students.

1.1 The Present Study

The primary objective of this study is to investigate the structural relationships among Digital Literacy (DL), Digital Well-being (DWb), and Digital Moral Values (DMV) of Syrian Migrant middle school students in Türkiye. The study posits a research model based on the theoretical interactions between these variables (Fig. 1). Although the employed instruments include theoretically defined subdimensions, the present study formulates and tests the hypotheses at the overall construct level (DL, DWb, and DMV) to focus on the structural relationships among the core concepts.

DL is a multidimensional concept that not only refers to individuals' technical ability to use digital technologies but also includes the competence to critically evaluate, produce, and share information in line with ethical principles (Ng, 2012; Hobbs, 2017). According to the critical digital literacy perspective, individuals with higher digital skills can more easily recognize ethical risks in online environments, and this awareness may shape their perceptions of moral values (Livingstone et al., 2018; Pangrazio & Selwyn, 2019); therefore, it is hypothesized that DL positively influences DMV (H1).

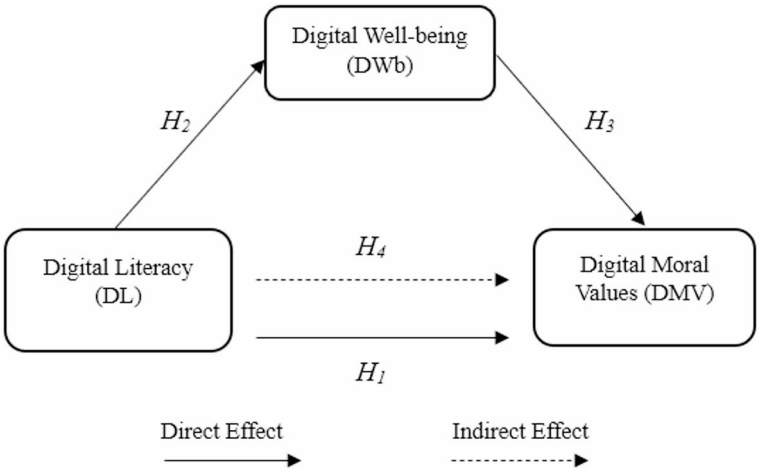

Fig. 1 Research framework

The literature also suggests that digital skills may enhance individuals' levels of DWb (Vanden Abeele, 2021), which forms the basis for the hypothesis that DL positively influences DWb (H2). DWb refers to the subjective well-being individuals experience when engaging with digital technologies (Vanden Abeele, 2021). A higher level of DWb is expected to support individuals in demonstrating more responsible and ethical behaviors in online environments (Ribble, 2015; Jones & Mitchell, 2016; Livingstone & Stoilova, 2021). Thus, it is hypothesized that DWb positively influences DMV (H3).

Finally, theoretical foundations in the literature suggest that DWb may play a mediating role in the relationship between skills and values (Przybylski & Weinstein, 2017; Kaur et al., 2022). Accordingly, the study posits that DWb mediates the relationship between DL and DMV (H4). Investigating these relationships through SEM in the context of Syrian Migrant students aims to fill a significant gap in the literature.

The conceptual framework and research hypotheses, developed based on the theoretical foundation, are presented in Fig. 1.

DL is a multidimensional concept that not only refers to individuals' technical ability to use digital technologies but also includes the competence to critically evaluate, produce, and share information in line with ethical principles (Ng, 2012; Hobbs, 2017). According to the critical digital literacy perspective, individuals with higher digital skills can more easily recognize ethical risks in online environments, and this awareness may shape their perceptions of moral values (Livingstone et al., 2018; Pangrazio & Selwyn, 2019). Therefore, the first hypothesis (H1) is based on the assumption that DL positively affects DMV. The literature also suggests that digital skills may enhance individuals' levels of DWB (Vanden Abeele, 2021), which forms the basis of the second hypothesis (H2). DWB refers to the subjective well-being individuals experience when engaging with digital technologies (Vanden Abeele, 2021). A higher level of DWB is expected to support individuals in demonstrating more responsible and ethical behaviors in online environments (Ribble, 2015; Jones & Mitchell, 2016; Livingstone & Stoilova, 2021). Thus, the third hypothesis (H3) assumes that DWB positively affects DMV. In addition, theoretical foundations in the literature suggest that DWB may play a mediating role in the relationship between DL and DMV (Przybylski & Weinstein, 2017; Kaur et al., 2022). Accordingly, the fourth hypothesis (H4) is based on the assumption that DWB partially mediates the relationship between DL and DMV. Investigating these relationships through SEM in the context of Syrian Migrant students will fill a significant gap in the literature.

2 Method

2.1 Participants and Procedure

For this purpose, the study group consisted of Syrian Migrant middle school students enrolled in a Migrant camp school located in a city in Eastern region of Türkiye during the 2024–2025 academic year. The criterion sampling technique, one of the purposive sampling methods, was employed (Patton, 2015). The main criteria were that

participants should be directly related to the study variables and enrolled in grades 5 through 8. In total, 526 students participated in the study. The participants ranged in age from 10 to 15 years.

Data were collected with voluntary participation. The study was conducted in full accordance with the ethical principles outlined in the Declaration of Helsinki. The demographic characteristics of the participants are presented in Table 1.

The sample consisted of 313 female and 213 male students. By grade level, the highest participation came from 6th graders ($n = 223$). Regarding mothers' educational levels, the largest group was middle school graduates ($n = 144$), while for fathers the largest group was high school graduates ($n = 183$). Concerning technological device ownership, 115 students reported having a device for less than one year, 116 for one year, 183 for two years, and 112 for three years or longer. The purposes of device use were reported as education ($n = 218$), entertainment ($n = 154$), and information seeking ($n = 154$). In terms of the most frequently used applications, 230 students preferred TikTok, 147 used YouTube, 97 used Instagram, and 52 reported using other applications. These findings provide a comprehensive overview of the demographic composition and digital context of the sample.

2.2 Measurements

In the study, the Digital Literacy (DL) Scale, the Digital Wellbeing (DWB) Scale, and the Middle School Students' Perceptions of Moral Values in Digital Environments (DMV) Scale were employed. In addition to these three scales, a Demographic Information Form consisting of 7 items, developed by the researchers, was used to gather participants' demographic data.

2.2.1 Demographic Information Form

To determine the personal and socio-demographic characteristics of the participants, a Demographic Information Form developed by the researcher was utilized. The form consisted of seven items. Participants were asked to provide information regarding their gender, grade level, duration of technological device ownership, most frequently used digital applications, purposes of device use, as well as their mothers' and fathers' educational levels. The data obtained through this form were used to describe the background characteristics of the participants.

Table 1 Demographic data

Gender	*n*	Grade Level	*n*	Mother's Education	*n*	Father's Education.	*n*
Female	313	5th grade	147	Illiterate	99	Illiterate	62
Male	213	6th grade	223	Primary school	102	Primary school	56
		7th grade	104	Middle school	144	Middle school	151
		8th grade	52	High school	132	High school	183
				University	49	University	74
Total	526						

2.2.2 Digital Literacy (DL) Scale

The Digital Literacy Scale, developed by Pala and Başıbüyük (2020), was used to determine the digital literacy levels of middle school students. The scale consists of 21 items across four dimensions: information processing, communication, security, and problem-solving. It employs a 5-point Likert-type response format ranging from "Strongly Disagree (1)" to "Strongly Agree (5)." A sample item from the scale is [e.g., I know that my personal information could be stolen, so I should not share my personal information online.].The internal consistency coefficient (Cronbach's alpha) was reported as 0.88 in the original study. In the present study, the Cronbach's alpha coefficient for the scale was calculated as 0.92.

2.2.3 Perceptions of Moral Values in Digital Environments (DMV)

Scale To measure students' perceptions of moral values in digital environments, the scale developed by Korkmaz et al. (2021) was employed. The scale comprises 17 items gathered under three subdimensions: Fairness–Responsibility, Compassion–Honesty, and Privacy–Courtesy. Responses are rated on a 5-point Likert scale. A sample item includes [e.g., I don't give bad nicknames to people around me in the digital world]. The original study reported a Cronbach's alpha coefficient of 0.87. In the current study, the reliability coefficient was found to be 0.89.

2.2.4 Digital Well-Being (DWb)

Scale The Digital Well-Being Scale, developed by Arslankara et al. (2022), was used to assess individuals' subjective well-being associated with the use of digital technologies. The scale consists of 12 items and three subdimensions: Digital Satisfaction, Safe and Responsible Behavior, and Digital Flourishing. It utilizes a 5-point Likert rating system. A sample item is [e.g., I take care not to exhibit behavior that disturbs other users on social media]. The Cronbach's alpha coefficient was reported as 0.79 in the original study. In this study, the Cronbach's alpha coefficient was calculated as 0.89.

2.3 Data Analysis

In this study, the assumption of univariate normality at the factor level for the DL, DMV, and DWb scales was examined, and the skewness and kurtosis values for all factors were found to be within the ±2 range (George & Mallery, 2019; Kline, 2016). This indicates that the dataset meets the normality assumption, allowing the use of the Maximum Likelihood (ML) method with confidence in confirmatory factor analysis (CFA) and structural equation modeling (SEM). The Cronbach's alpha coefficients of the final forms of the three scales were $\alpha = 0.923$ for DL, $\alpha = 0.896$ for DMV, and $\alpha = 0.895$ for DWb, all of which indicate a high level of internal consistency ($\alpha \geq 0.80$; Nunnally & Bernstein, 1994). According to the correlation analysis, there were significant but low-level negative relationships between DL and DMV ($r = -.131$, $p < .01$) and between DL and DWb ($r = -.107$, $p < .05$), while the positive

relationship between DMV and DWb was not statistically significant ($r = .050$, $p > .05$). Based on Cohen's (1988) classification, all significant correlations were evaluated as low-level (Table 2).

To evaluate model fit, several goodness-of-fit indices were considered, following commonly accepted guidelines in the structural equation modeling literature. A χ^2/df ratio below 3 indicates good fit, while values up to 5 are considered acceptable (Kline, 2016). RMSEA values below 0.05 indicate excellent fit, and values below 0.08 indicate acceptable fit (Steiger, 2007). RMR and SRMR values of 0.08 or lower suggest good fit (Hu & Bentler, 1999). For incremental fit indices, CFI and TLI values of 0.90 or above indicate acceptable fit, whereas values of 0.95 or higher reflect excellent fit (Bentler, 1990; Hu & Bentler, 1999). These criteria were used to evaluate the measurement and structural models presented in Tables 3 and 4.

3 Findings

After confirming that the dataset met the normality assumption and that the Maximum Likelihood (ML) method could be applied, the findings related to the research model were presented. In this context, the model fit indices obtained through Confirmatory Factor Analysis (CFA) for the employed scales were first reported, followed by the results of the measurement model, the structural model, and the findings regarding the mediation effect.

According to the results of the confirmatory factor analyses (CFA) for the three scales, Items M11 and M15 were removed from the DL scale, and Items 7 and 11 from the DMV scale, because their factor loadings were below 0.50 (Hair et al., 2010). In addition, for Item 5 of the second scale, modification indices (MI) suggested multiple error covariances; therefore, in order to preserve the theoretical integrity of the construct, this item was also excluded from the model. To improve model fit, error covariances were specified between items within the same factor that displayed high content similarity (e.g., M16–M17, M7–M8, M16–M10; Items 12–13, Items 16–17). Such modifications are recommended in cases where shared variance between items can reasonably be expected (Byrne, 2010; Kline, 2016).

In contrast, for the DWb scale, no item deletion or additional error covariance was required, and the original structure was directly supported. According to the final CFA results, the fit indices obtained for all three scales met or exceeded the threshold values commonly accepted in the literature (Hu & Bentler, 1999; Steiger, 2007; Hair et al., 2010) demonstrating that structural validity was achieved and that the models were suitable for use in structural equation modeling.

3.1 Measurement Model Test

In the measurement model analysis where all latent variables were tested simultaneously, items D10, D7, and D8 were removed from the model due to factor loadings below 0.50 (Hair et al., 2010). To improve model fit, modification indices (MI) were examined, and error covariances were specified between items within the same factor that showed conceptual similarity (Byrne, 2010; Kline, 2016). The final measure-

Table 2 Descriptive statistics, cronbach's alpha coefficients and correlations among variables

Scale/Sub-dimensions	α	Mean	SD	Skewness	Kurtosis	1	2	3
DL	,922	–	–	–	–	—	-0.131**	-0.107*
DLinf	–	3.74	0.91	-0.816	0.703			
DLcom	–	3.87	0.83	-0.803	0.778			
DLsec	–	3.70	0.83	-1.052	1.554			
DLprob	–	3.75	0.92	-1.048	0.958			
DMV	,896	–	–	–	–		—	0.050
DMVfr	–	3.63	0.83	-0.409	-0.548			
DMVch	–	3.55	0.94	-0.246	-0.648			
DMVpc	–	3.53	0.88	-0.310	-0.397			
DWB	,895	–	–	–	–			—
DWBds	–	3.23	1.07	-0.121	-0.639			
DWBsec	–	3.25	1.05	-0.201	-0.622			
DWBdw	–	3.37	0.94	-0.215	-0.472			

α Cronbach's alpha coefficient, *SD* Standard deviation. *$p < .05$, **$p < .01$. Cronbach's alpha coefficients were calculated based on the remaining items after the confirmatory factor analysis (CFA)

Table 3 CFA model fit indices for the scales used

Model	χ^2/df	RMSEA (90% CI)	RMR	GFI	AGFI	NFI	TLI	CFI
DL	4.221	0.078 (0.072–0.085)	0.082	0.889	0.852	0.886	0.892	0.910
DMV	3.892	0.074 (0.065–0.083)	0.073	0.930	0.899	0.903	0.906	0.925
DWb	1.953	0.043 (0.030–0.055)	0.051	0.969	0.953	0.960	0.974	0.980

χ^2/df≤3 indicates good fit, ≤ 5 indicates acceptable fit (Kline, 2016); RMSEA≤0.05 indicates excellent fit (Steiger, 2007); RMR/SRMR≤0.08 indicates good fit (Hu & Bentler, 1999); CFI and TLI≥0.95 indicate excellent fit (Bentler, 1990); GFI≥0.95 indicates excellent fit (Hair et al., 2010)

Table 4 Fit indices for the measurement model

Model	χ^2/df	RMSEA (90% CI)	RMR	GFI	AGFI	NFI	TLI	CFI
Final Measurement Model	2.576	0.055 (0.052–0.058)	0.085	0.831	0.812	0.803	0.862	0.869

χ^2/df≤3=good fit, ≤ 5=acceptable fit (Kline, 2016); RMSEA≤0.05=excellent fit, ≤ 0.08=good fit (Steiger, 2007); RMR/SRMR≤0.08=good fit (Hu & Bentler, 1999); CFI and TLI≥0.90=good fit (Bentler, 1990); GFI≥0.85=acceptable fit (Hair et al., 2010)

ment model demonstrated a good level of fit with χ^2/df=2.576 and RMSEA=0.055 (90% CI=0.052–0.058; PCLOSE = 0.003). Although GFI=0.831 and AGFI=0.812 were close to acceptable thresholds and CFI=0.869 and TLI=0.862 remained slightly below the commonly accepted cutoff (≥0.90), the model was still considered acceptable when accounting for its scope and parsimony indices (PNFI=0.759, PCFI=0.822). These findings indicate that the measurement model was adequate to proceed with structural equation modeling (Fig. 2).

3.2 Structural Model

Within the scope of H1, the path from DL → DMV was found to be negative and statistically significant ($\beta = -0.164$, $p < .001$). The model explained 3% of the variance in DMV ($R^2 = 0.03$). Contrary to the expected positive direction, this negative relationship can be interpreted as students with higher levels of DL evaluating the ethical dimensions of digital environments more critically and consequently reporting lower scores in their moral value perceptions (Fig. 3and Table 5).

3.3 Mediating Effect

Within the scope of H4, the mediating role of DWb in the relationship between DL and DMV was examined using the bootstrap method (5,000 samples, 95% BCa CI). The obtained indirect effect coefficient ($\beta = -0.004$) was not statistically significant, as the confidence interval included zero [–0.023, 0.009]. This result indicates that the mediating role of DWb was not supported (Fig. 4 and Table 6).

In the structural model, none of the four tested hypotheses were supported in the expected positive direction. Although the paths in H1 and H2 were statistically significant, the negative coefficients indicated that higher DL levels decreased both DMV ($\beta = -0.164$, $p < .001$) and DWb ($\beta = -0.153$, $p = .002$). Under H3, the effect of DWb on DMV was found to be nonsignificant ($\beta = 0.026$, $p = .562$), which implies that one of the fundamental conditions for mediation was not met. Indeed, the bootstrap

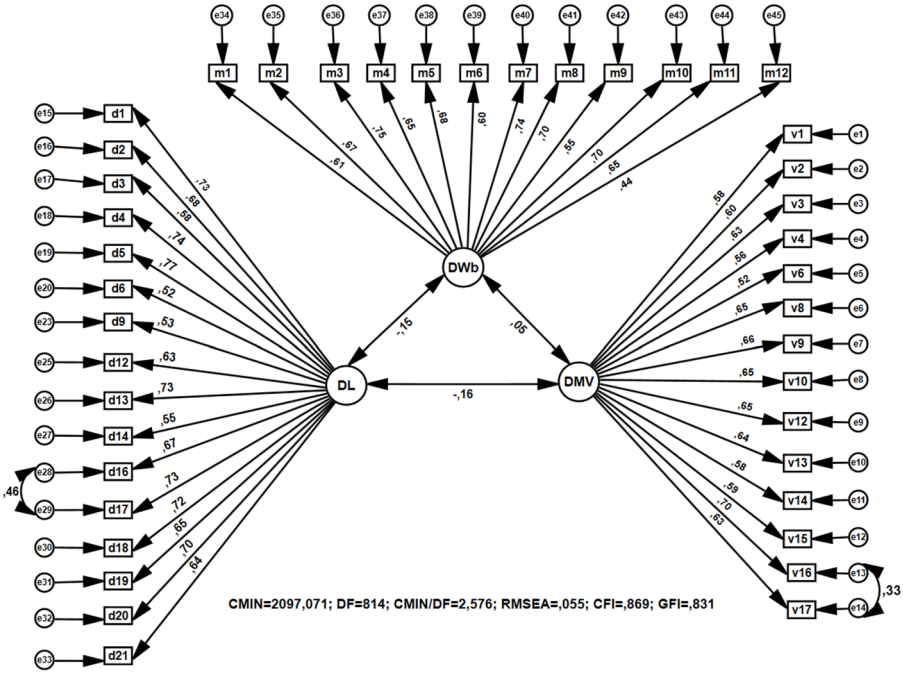

Fig. 2 Measurement model test

analysis (5000 samples, 95% BCa CI) revealed that the indirect effect ($\beta = -0.004$, CI [–0.023, 0.009]) was not significant, and thus H4 was not supported. These findings suggest that the relationships within the model occurred in directions contrary to expectations and indicate that the effects of DL on the examined variables may be explained by more complex mechanisms.

4 Discussion

In this study, the relationships among DL, DWb, and DMV of Syrian migrant middle school students were examined using SEM. The findings revealed that the expected positive associations were not supported.

The first hypothesis (H1) predicted that DL would positively influence students' DMV. However, the results indicated that this relationship was negative and statistically significant. This suggests that students with higher levels of DL may be more sensitive to ethical issues, risks, and value conflicts encountered in online environments. Indeed, according to the critical digital literacy perspective, an increase in individuals' digital competencies not only enhances their technical usage but also enables them to better recognize ethical problems in digital contexts. Livingstone et al. (2018) and Pangrazio and Selwyn (2019) emphasized that individuals with higher digital competencies are more likely to detect ethical dilemmas in online spaces and, as a result, adopt a more critical and questioning stance in their moral evaluations.

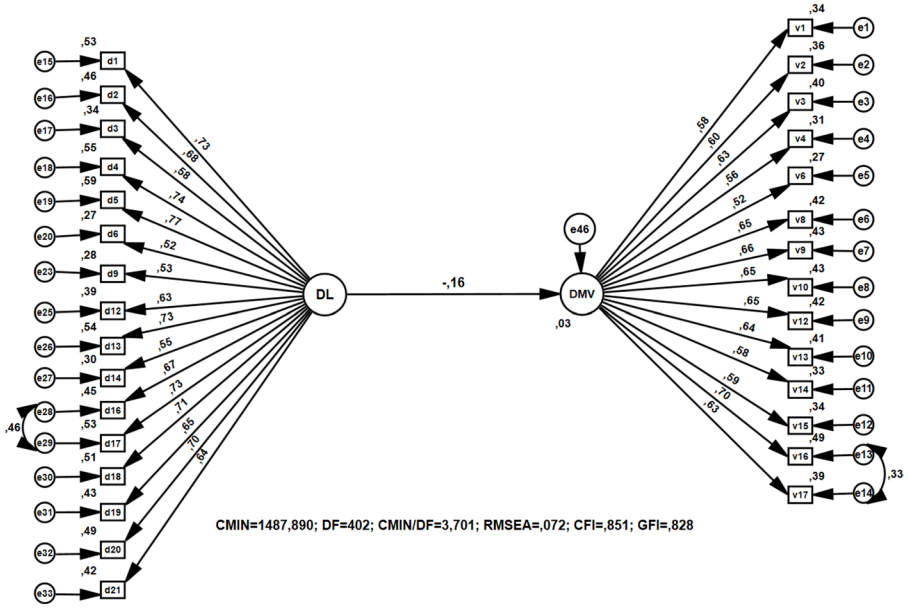

Fig. 3 Structural model

Table 5 Path coefficients of the structural model

Dependent Variable	Independent Variable	β	B	S.E.	C.*R*.	*p*	R^2
DMV	DL	-0.164	-0.158	0.047	-3.356	***	0.03

*** $p < .001$. R^2 = proportion of explained variance

Similarly, Helsper and van Deursen (2017) highlighted that users with advanced digital skills may experience the negative aspects of online environments more intensely due to their heightened awareness. The results of the present study align with this perspective but also point to unique contextual dynamics. Particularly for migrant students, the digital environment is often fraught with misinformation, hate speech, and cultural conflicts, which are more readily recognized by those with higher DL. [Furthermore, a "survival" perspective offers a complementary explanation for this negative relationship. Research suggests that structurally vulnerable youth may prioritize pragmatic outcomes—such as accessing restricted information or maintaining communication channels—over strict adherence to digital etiquette (Alencar et al., 2019; Gillespie et al., 2018). In this context, students with high technical skills might view certain ethical transgressions (e.g., bypassing restrictions or copyright rules) not as moral failures but as necessary coping strategies to overcome barriers. Consequently, their practical application of digital skills for survival may conflict with the normative statements in standard moral value scales, resulting in lower DMV scores.] Therefore, the negative association found under H1 can be considered an original contribution interpreting digital ethics through the lens of critical literacy and structural vulnerability.

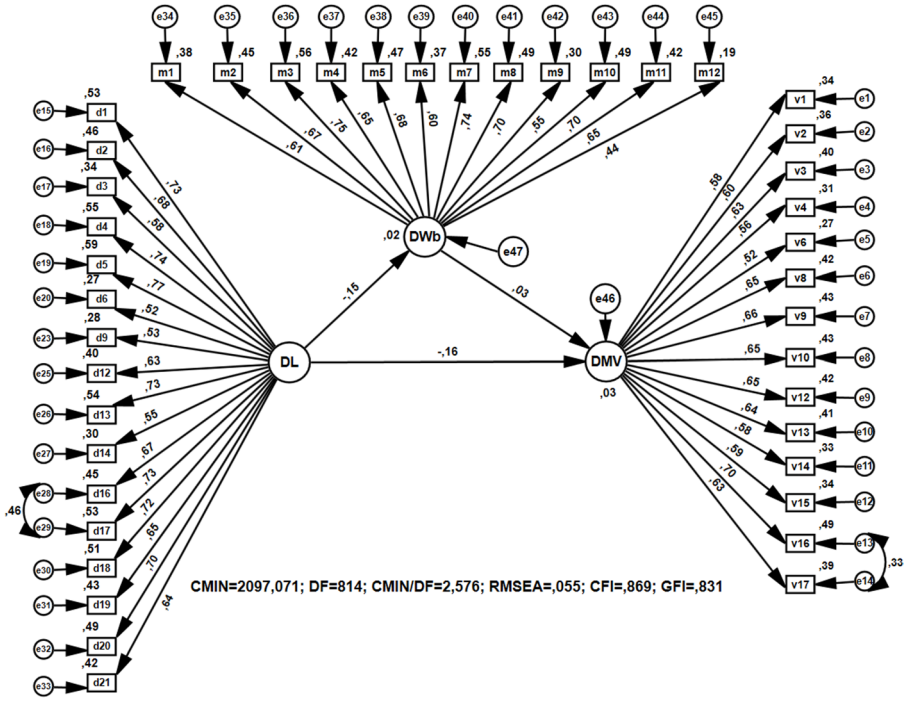

Fig. 4 Mediation test

Table 6 Hypothesis testing results

Hypothesis	Path	Expected Direction	Standardized β	*p*	R^2	Result
H_1	**DL → DMV**	(+)	-0.164	<0.001***	0.03	Not supported (opposite direction)
H_2	**DL → DWb**	(+)	-0.153	0.002**	0.02	Not supported (opposite direction)
H_3	**DWb → DMV**	(+)	0.026	0.562	0.03	Not supported (nonsignificant)
H_4	**DL → DWb→ DMV**	(+)	-0.004	CI [-0.023, 0.009]	—	Not supported (no mediation)

*** $p < .001$; ** $p < .01$; * $p < .05$. R^2 indicates the proportion of explained variance in the dependent variable. For H4, a bootstrap 95% BCa confidence interval is reported instead of a *p*-value

The second hypothesis (H2) predicted that DL would positively influence students' DWb. However, the findings indicated that this relationship was negative and statistically significant. This result suggests that students with higher digital competencies may be more exposed to the risks and threats of digital environments, and that such heightened awareness may adversely affect their perceptions of well-being. Helsper and van Deursen (2017) noted that users with advanced digital skills become more sensitive to the potential harms of online spaces, which can have negative consequences for their psychological well-being. Similarly, Twenge and Campbell (2018)

demonstrated that adolescents' levels of well-being vary according to their digital media use profiles, with social media use in particular being associated with anxiety, loneliness, and unhappiness in certain contexts. In the present study, the specific context of migrant students offers a critical explanation for this negative outcome. Specifically, the concept of the second-level digital divide, which refers to inequalities in the quality, autonomy, and outcomes of digital use despite access, is particularly pertinent in this context. While Syrian migrant students may possess relatively high operational digital skills, they often lack stable, autonomous, and supportive digital access conditions. This mismatch between their digital capabilities and their actual opportunities for meaningful and safe digital engagement is likely to generate frustration, perceived exclusion, and psychological strain, thereby undermining their digital well-being (Alam & Imran, 2015). Moreover, contextual stressors such as limited technological infrastructure in migrant camp settings, ongoing migration-related challenges, and socio-cultural constraints may further intensify this negative relationship. Therefore, the reversed support of H2 demonstrates that digital literacy alone does not guarantee students' digital well-being. Rather, when advanced digital awareness is not accompanied by adequate resources, supportive environments, and equitable access conditions, it may exacerbate perceptions of inequality and contribute to lower levels of psychological well-being.

The third hypothesis (H3) assumed that students' DWb would positively influence their DMV. However, the analyses revealed that this relationship was not statistically significant. This finding indicates that digital well-being does not necessarily translate into students' ethical behaviors or moral value perceptions in digital contexts. Previous research emphasizes that the effects of digital well-being are highly contingent on usage patterns, content characteristics, and social context (Twenge & Campbell, 2018; Przybylski & Weinstein, 2017). For instance, Kaur et al. (2022) demonstrated that adolescents' levels of digital well-being fluctuate depending on the quality of their online interactions, with exposure to negative or superficial content undermining both psychological and ethical outcomes. Similarly, Vanden Abeele (2021) conceptualized digital well-being as a dynamic and situational construct that manifests differently depending on the purposes and conditions of digital engagement.

Within the specific context of migrant students, the absence of a significant relationship between DWb and DMV appears particularly plausible. For displaced youth, digital environments often function primarily as tools for emotional regulation, distraction, or maintaining transnational family ties, rather than as spaces for normative or civic engagement. As a result, students may experience a sense of psychological relief or emotional comfort through digital activities such as entertainment or communication with relatives, without these experiences necessarily reinforcing ethical norms or moral expectations within digital environments (Alencar et al., 2019). In this sense, digital well-being may operate as an individualized and affective experience, whereas digital moral values reflect socially constructed and context-dependent norms, leading to a functional separation between feeling well and acting ethically online. Taken together, these findings suggest that digital well-being alone may not serve as a sufficient mechanism for strengthening moral values in digital contexts. Instead, the relationship between well-being and ethical behavior appears to be

shaped by broader contextual, motivational, and socio-cultural factors, particularly among structurally vulnerable student populations.

Considering that a substantial portion of students in our study reported using technology primarily for entertainment and social media purposes, the absence of a significant relationship between DWb and DMV appears understandable. Moreover, the socio-cultural conditions of the Migrant student group, limited opportunities for digital access, and the psychological burdens associated with traumatic migration experiences may have further weakened the link between digital wellbeing and ethical value perceptions (Barrett et al., 2014). This suggests that DWb alone may not function as a factor that strengthens moral values, and that contextual conditions play a decisive role in shaping this relationship.

The fourth hypothesis (H4) posited that digital well-being (DWb) would mediate the relationship between digital literacy (DL) and digital moral values (DMV); however, the SEM results indicated that this mediating effect was not supported. In other words, students' levels of DWb did not significantly explain the association between DL and DMV. This outcome can be attributed to the disruption of the expected theoretical pathway under the specific contextual conditions identified in this study. Previous research suggests that mediation effects typically depend on stable and consistent direct relationships among the variables involved (Hayes, 2017; Zhao et al., 2010). In the present study, however, the migrant students' context—characterized by structural vulnerability and exposure to cumulative stressors—was associated with negative relationships between DL and both DWb and DMV. As a result, digital well-being could not function as an effective intermediary, as higher levels of digital literacy did not enhance students' well-being but were instead associated with lower DWb scores. Moreover, migrant students' predominant use of digital environments for emotional coping, distraction, or entertainment may have further weakened the connection between well-being and ethical value formation (Barrett et al., 2014; Livingstone & Stoilova, 2021). This pattern aligns with Vanden Abeele's (2021) conceptualization of digital well-being as a dynamic and context-dependent construct rather than a stable resource that uniformly promotes other positive developmental outcomes. Taken together, the lack of support for H4 suggests that, particularly in high-stress and displacement-related contexts, digital literacy, digital well-being, and moral values may not operate within a simple linear mediation structure. Instead, these constructs may be shaped by distinct contextual and motivational processes, underscoring the importance of considering environmental and psychosocial factors when modeling digital experiences among structurally vulnerable student populations.

Overall, the findings of this research demonstrate that the relationships among DL, DWb, and DMV in Migrant students are not as straightforward or linear as often assumed in the literature. Particularly, the unexpected negative effects of DL call for a rethinking of theoretical assumptions and greater attention to the specific context of Migrant learners. The results suggest that higher digital competence does not always lead to positive outcomes; rather, increased risk awareness may reduce both ethical perceptions and wellbeing scores. This underscores the importance of addressing the pedagogical, cultural, and psychosocial dimensions of digitalization in an integrated manner. Consequently, the study highlights the need for more in-depth, context-sen-

sitive, and multidimensional research to fully understand the opportunities and risks that migrant students face in the digital age.

5 Limitations

This study was conducted within a specific context and set of conditions; therefore, the generalizability of the findings is subject to certain limitations. First, the sample consisted solely of 526 Syrian Migrant middle school students residing in a Migrant camp in eastern Türkiye. As such, the results may not be directly applicable to Migrant or native students living in different socio-cultural environments. Second, the data were collected through self-report measures, which may have been influenced by factors such as social desirability bias or misinterpretation of items, potentially introducing response bias. Third, although the instruments employed were previously validated and demonstrated adequate reliability, they capture only certain dimensions of DL, DWb, and DMV, thus limiting the scope of the constructs under investigation. Fourth, the cross-sectional design limits causal inference regarding the directionality among digital literacy, digital well-being, and digital moral values. Although SEM allows theory-driven testing of structural relations, it does not establish causality in the absence of temporal ordering or experimental manipulation. Future studies may employ longitudinal or intervention-based designs to better examine causal mechanisms among these constructs.

6 Recommendations

The findings of this study offer multidimensional implications for educators, policymakers, and researchers. First, in teacher training and instructional practices, it is crucial not to limit the development of DL to technical knowledge and skills alone; instead, equal attention should be given to fostering students' ethical awareness, responsible usage habits, and levels of DWb. Accordingly, curriculum content may integrate applied activities, project-based learning practices, and case analyses that emphasize the importance of ethical values in digital environments, online safety, and digital well-being.

For policymakers, there is a need to implement comprehensive projects that both expand Migrant students' access to digital resources and establish protective mechanisms against the potential risks of digital technologies. In this context, providing technical infrastructure support to schools, enhancing internet access in low-income or disadvantaged areas, and disseminating digital safety education should be prioritized.

Additionally, programs aimed at strengthening Migrant students' DL, ethical awareness, and DWb should be designed in ways that are sensitive to cultural contexts. The development of multilingual and culturally inclusive teaching materials can play a pivotal role in supporting both academic success and social integration. By validating the model using longitudinal designs that monitor migrant kids' digital

experiences over time, future research may expand on the current findings and enable more robust conclusions on directionality and other causal pathways. Intervention or quasi-experimental research (e.g., digital ethics and digital well-being programs) may potentially shed light on whether increases in particular competences result in shifts in judgments of moral values and well-being. Furthermore, qualitative in-depth research (such as semi-structured interviews or focus groups) could investigate how migrant students understand "well-being" and "moral values" in digital contexts and why some proposed paths were not significant in the current sample, especially taking into account contextual factors like camp living conditions, exposure to online risks, and cultural norms.

7 Conclusion

This study comprehensively examined the relationships among Syrian Migrant middle school students' levels of DL, DWb, and DMV in Türkiye through structural equation modeling. The analyses revealed a divergence from the initially hypothesized positive associations, indicating that DL was negatively and significantly related to both DWb and DMV. Moreover, the mediating role of DWb was not statistically supported, suggesting the presence of more complex dynamics in the interaction between digital skills and ethical perceptions than initially anticipated.

These findings suggest that students with higher levels of DL may adopt a more critical and questioning perspective toward the ethical dimensions of digital environments, which in turn could result in lower self-reported scores on ethical perception scales. Similarly, the absence of a significant effect of DWb on DMV indicates that individuals' digital experiences cannot be sufficiently explained by emotional well-being alone, but rather represent a multidimensional phenomenon.

Overall, the study underscores the nonlinear, context-sensitive, and socio-culturally influenced nature of the relationships between digital skills, ethical awareness, and well-being. In this regard, digital citizenship, digital well-being, and ethical awareness programs developed for Migrant students should not only address technical competencies but also incorporate components such as critical thinking, responsible use, and cultural sensitivity. The findings provide valuable evidence for policymakers, educators, and non-governmental organizations seeking to reduce digital inequalities and to foster healthier, more conscious engagement with digital environments among students.

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Declarations

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Authors and Affiliations

Mehmet Adıyaman[1] · **Hulusi Geçgel**[1]

✉ Mehmet Adıyaman
mehmetadiyamann@hotmail.com

Hulusi Geçgel
hgecgel@comu.edu.tr

[1] Çanakkale Onsekiz Mart University, Çanakkale, Turkey