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When background matters: how gender and family business background shape students' digital entrepreneurial intentions in Jordan

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ABSTRACT

While digital entrepreneurship offers a pathway for economic growth in developing nations, existing models often overlook how contextual 'background filters' shape student intentions. Therefore, the study addresses this gap by investigating the predictors of Digital Entrepreneurial Intention (DEI) from a sample of 399 business students in Jordan. Grounded in the Theory of Planned Behavior (TPB), we model attitude toward entrepreneurship (ATE), subjective norms (SN) and perceived behavioral control (PBC) as proximal predictors of DEI and incorporate locus of control (LC) and digital literacy (DL) as additional antecedents. Gender and family business background (FBB) are tested as moderators of the TPB–DEI relationships. The PLS–SEM results indicated that ATE and PBC have strong positive effects on DEI, with locus of control reinforcing both ATE and PBC. However, SN appears to have a positive but marginal effect. Surprisingly, the findings indicated an inverse relationship between digital literacy and DEI, suggesting that higher digital competence may channel students toward attractive salaried digital jobs and increase awareness of entrepreneurial risk rather than automatically motivating new venture creation. Finally, FBB and Gender moderate some relationships. The results are expected to advance DEI knowledge and help educators and policymakers improve digital entrepreneurial readiness in developing economies.

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1. Introduction

Digital entrepreneurship has become a key driver of online job creation as it lowers entry barriers, reduces startup costs and allows scalable business models that can serve customers in international markets (Nguyen & Nguyen, 2024). For countries with constrained physical infrastructure and high youth unemployment, digital ventures are often more feasible than capital-intensive brick-and-mortar businesses, as they can be launched with limited physical assets and monetized through platforms and online services (Samara & Terzian, 2021). Youth are often the primary beneficiaries of such opportunities, as they grew up in an advanced technological era and are thus assumed to be more experienced in operating within online ecosystems (Salimi et al., 2025). Nevertheless, the expansion of digital opportunities has not automatically converted into sufficient employment outcomes. In many developing economies, youth unemployment remains inflexibly high. Take Jordan, for example: the youth unemployment rate has worsened over the last decade, reaching 46.1% (World Bank, 2025). These statistics are not just numbers; they convey a challenging situation that most young Jordanians face. The government of Jordan started to respond. It initiated major reforms and implemented strategies to strengthen its digital startup ecosystem. Yet, despite these efforts, the unemployment problem seems to persist, raising questions about the effectiveness of current policies and our comprehension of the factors forming youth entrepreneurial intention.

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Consequently, understanding these factors has drawn the attention of many academic researchers, who have examined a wide range of aspects (e.g. psychological, environmental, social, and contextual), most often using the Theory of Planned Behavior (TPB) as the main theoretical lens (Murad et al., 2025; Sharma et al., 2026). TPB posits that attitude toward entrepreneurship (ATE), subjective norms (SN) and perceived behavioral control (PBC) jointly shape intention, and numerous studies confirm their predictive power for students' entrepreneurial intentions across different countries (Kariv et al., 2024; Tchokoté et al., 2025). At the same time, scholars have begun to extend TPB by incorporating personality traits, education and contextual resources. Utami et al. (2025), for example, examine how traits such as attitude toward risk and digital literacy, together with entrepreneurship education, influence Gen Z students' intentions. Ta et al. (2025) analyze how Big Five personality traits affect digital entrepreneurial intention via digital self-efficacy, while Kariv et al. (2024) explore the interplay between entrepreneurship education, self-efficacy and personality. Specifically in the context of digital venturing, Tseng et al. (2022) combine TPB with internal locus of control and cyber-entrepreneurship education to predict cyber entrepreneurial intention in Taiwan, showing that locus of control strengthens TPB cognitions and that specialized education moderates some TPB–intention relationships. Together, this work confirms the usefulness of TPB and highlights the importance of psychological dispositions, self-efficacy and education in shaping entrepreneurial intentions.

Despite these advances, several important gaps remain. First, most TPB-based studies have been conducted in relatively high-income or upper-middle-income settings such as Hong Kong, Peru, Malaysia, Taiwan or OECD countries (Chin et al., 2024; González-Prida et al., 2024; Tseng et al., 2022; Zhuang et al., 2022), with far less evidence from low-resource, necessity-driven contexts in the Middle East (Alkhalailah, 2024). That limits the generalizability of existing findings to countries like Jordan, where structural unemployment, extended family obligations and gendered expectations may substantially alter how young people perceive entrepreneurial risk and opportunity. Second, although TPB has been enriched with psychological constructs, relatively few studies integrate TPB, internal locus of control and digital-context variables within a single model. Tseng et al. (2022) take an important step by incorporating locus of control and cyber-entrepreneurship education, and Setyadi et al. (2025) point to the importance of digital technology literacy and modern learning environments; however, these contributions do not jointly model locus of control, digital literacy and TPB components as predictors of digital entrepreneurial intention (DEI), nor do they systematically examine their interplay in a unified framework. Third, digital literacy is often treated as a background characteristic rather than as a core antecedent of intention; consequently, we still know little about whether higher digital literacy consistently strengthens, weakens or complicates the decision to pursue digital entrepreneurship (Liang et al., 2025; Zeynalov & Doğantan, 2025). Fourth, the role of family business background and gender remains under-specified at the level of TPB mechanisms. Recent studies show that students from entrepreneurial families tend to report stronger entrepreneurial intentions, benefiting from role models, early exposure to business and richer entrepreneurial human capital (Arshad et al., 2025; Szabó & Aranyossy, 2024). Charlie and Ida (2023) further find that entrepreneurship education and family background both increase intention, and that gender moderates these effects for Indonesian students. Yet these studies, like most work on demographic influences, treat family business background and gender as direct predictors or moderators of education, not as moderators of the core TPB pathways from attitude, subjective norms and PBC to intention. We still lack empirical evidence on whether, and how, family business background and gender reshape the psychological mechanisms proposed by TPB, particularly in the digital domain and in developing-country settings. Accordingly, this study addresses the following research questions:

1. Do TPB factors (ATE, SN, and PBC) positively affect Jordanian students' DEI?
2. Does internal locus of control affect students' ATE and PBC?
3. Does digital literacy directly affect students' DEI?
4. Do gender and family business background moderate the relationships between TPB factors and DEI?

To answer these questions, we develop an integrated TPB-based model of DEI among undergraduate business students in Jordan. We conceptualize DEI as students' motivation and readiness to start an online or digitally enabled business and model it as a function of attitude toward entrepreneurship,

subjective norms and perceived behavioral control, complemented by internal locus of control and digital literacy. We then examine whether gender and family business background moderate the relationships between TPB antecedents and DEI. By doing so, the study contributes to the current literature in three major ways: (1) extends TPB to a digital, necessity-driven context that is under-represented in current research; (2) clarifies the joint role of digital literacy and locus of control in shaping DEI; and (3) offers a novel test of family business background and gender as moderators of TPB pathways, providing a more nuanced understanding of how background factors amplify or dampen digital entrepreneurial motivation among youth in an emerging economy.

2. Literature review

2.1. *The theory of planned behavior*

Researchers have increasingly turned to established psychological models to understand why some individuals pursue entrepreneurship (Liñán & Chen, 2009; Shapero, 1984). Among several theoretical models available, Ajzen's TPB (1991) has been highly used in exploring decision-making processes for entrepreneurship (Al-Mamary & Alraja, 2022). In the TPB context, entrepreneurial intention emerged as an important characteristic required to understand the motives behind individuals' behaviors and, more importantly, towards entrepreneurship (Fishbein & Ajzen, 2011; Krueger & Carsrud, 1993). TPB assumes that intention is the immediate antecedent in a causal chain, including the attitude towards entrepreneurship, subjective norms, and perceived behavioral control, and that each of these three factors contributes to an individual's inclination towards entrepreneurship (Bird & Jelinek, 1989). Collectively, these factors will provide a structure to investigate an individual's DEI.

Attitude Toward Entrepreneurship (ATE) reflects the individual's positive or negative evaluation of becoming an entrepreneur (Liñán & Chen, 2009). Many studies have claimed that ATE as a powerful predecessor of EI (Murad et al., 2025). For example, Wardoyo et al. (2025) argue that digital business-oriented students are more likely to pursue entrepreneurial activities when they see entrepreneurship as an attractive career option. Coupled with Lopes et al. (2025), a positive ATE can promote the exploration of business opportunities while cultivating an innovative and risk-taking mindset; these qualities are considered core successful attributes in the entrepreneurial individuals (Caputo et al., 2024). In the online context, these relationships imply that students with high ATE can view entrepreneurship positively and are more likely to see digital venturing as desirable and worth pursuing.

Subjective Norms (SN) are social pressures from one's significant others, including family, peers, and mentors, when performing entrepreneurial behavior (Liñán & Chen, 2009). In their study from 897 Vietnamese students, Nguyen & Nguyen (2024) showed that a supportive social environment, where individuals' close circle encourages and approves entrepreneurship can greatly increase the likelihood of students intending to launch digital ventures. Further evidence comes from Albania, which found that students showed significant effects from SN alongside with self-efficacy and innovativeness, suggesting that local cultural factors may shape these norms differently (Çela et al., 2024).

However, SN can increasingly be relevant in collectivist societies, where social approval and family expectations carry substantial weight (Chin et al., 2024). In such societies, entrepreneurial values are less common, and individuals fear failure and judgment. That can be particularly relevant in Jordan's 'culture of shame,' which is often concerned with public perception and is heavily influenced by community values that overshadow individual needs; as a result, students may hesitate to pursue entrepreneurial endeavors without such approval (Jarrar, 2022).

On a different note, research also indicates that the effect of SN may vary by gender or being conditioned by locus of control and exposure to entrepreneurship education (González-Prida et al., 2024; Tseng et al., 2022). These findings argue that while SN is an important part of the TPB framework, its influence on DEI can often be context-dependent and entangled with demographic and other psychological factors.

Perceived Behavioral Control (PBC) refers to individuals' perceptions of the ease and difficulty of performing any entrepreneurial act (Liñán & Chen, 2009). It is considered the primary determinant of DEI (Alferaih, 2022). Reis's (2024) study supports that. It showed that students' belief in their entrepreneurial abilities greatly empowers them to address the inevitable entrepreneurial challenges and cultivate

resilience, which subsequently can increase their DEI. When individuals believe they have what it takes to fulfil a task, it boosts their confidence and makes them more likely to finish it. That aligns with social cognitive theory, as self-efficacy (or PBC, as many studies indicate) impacts motivation and determines the effort they put in. The lack of it, on the other hand, leads them to avoid tasks they see as beyond their skills (Bandura, 1986). Thus, we assume the following:

H1: ATE has a positive, direct influence on students' DEI.

H2: SN have a positive and direct effect on DEI.

H3: PBC have a positive, direct impact on DEI.

2.2. Locus of control and TPB antecedents

Recent research has showed that personality traits are the key internal motivators that drives people toward entrepreneurship (Lopes et al., 2025; Ta et al., 2025). Locus of control (LC), for example, is a trait that appears stronger among entrepreneurs than in non-entrepreneurs. As a definition, internal LC is the person's belief that they can shape their own destiny and that the external circumstances are the result of their previous actions, and at any point they don't feel satisfied with their lives, instead of blaming people or the environment, they take full responsibility for their actions (Rotter, 1966). However, those with an external locus often attribute outcomes to luck, fate, or the influence of others (Tseng et al., 2022). Within the TPB framework, personality traits are considered foundational factors that shape beliefs and perceptions (Ajzen, 1991; Fishbein & Ajzen, 2011), which in turn influence intentions and actions (Fuller & Marler, 2009). Empirical research backs this up, as individuals with an internal LC often link success to their effort and are likelier to hold positive ATE and, thus, evaluate entrepreneurial careers more favorably (Tchokoté et al., 2025).

In line with that, individuals with a strong internal LC tend to show high perceived behavioral control (PBC) as they are expected to believe in their ability to handle the inevitable challenges that come with entrepreneurial endeavors (Tseng et al., 2022). Not to mention that internal LC are argued to increase greater confidence (Anwar et al., 2021) and a stronger sense of control over their actions. Some research has examined the direct relationship between LC and DEI, while most suggest an indirect effect mediated by ATE and PBC (Tan et al., 2021) due to the argument that personality traits (e.g. LC) are more likely to change perceptions and beliefs first, not intentions (Lopes et al., 2025). Thus, we propose:

H4: LC has a positive, direct effect on students ATE.

H5: LC has a positive, direct impact on PBC.

2.3. Digital literacy and its influence on digital entrepreneurial intention

The digital economy has provided ample opportunities for entrepreneurship in almost all online sectors (Kraus et al., 2023). In this context, digital literacy (DL) is the ability to effectively utilize digital tools, platforms, and resources to access, assess, create, and communicate information, which has been considered the core skill in this area (Ng, 2012). DL is assumed to empower individuals to analyze potential digital opportunities (Khoo et al., 2024) and to build the confidence needed to tackle challenges in the online world (Wardoyo et al., 2025). Several research-based studies investigate the capability of an individual with higher digital competency, this includes the study of Akhter et al. (2022). The study claimed that stronger digital skills have a greater tendency for students to pursue digital entrepreneurship. The interpretation of the results supports a hypothesis that people who have acquired DL are more likely to base their faith on their capability and mitigate perceived market entry barriers to initiate and run start-ups (Setyadi et al., 2025). More recently, Zeynalov and Doğantan (2025) found that DL does not just provide skills; it can make students more innovative.

On the other hand, some evidence suggests that the DL-DEI relationship is not uniformly positive. Some find non-significant or context-dependent effects of DL on students' intention to start a business (Alkhalailah et al., 2023; Modise & Rambe, 2024). They argue that digitally literate students often secure attractive employment opportunities in established organizations, making digital careers a viable

alternative to risky self-employment. Taken together, these mixed findings show that the net effect of DL on DEI is an empirical question that may vary by labor-market conditions and opportunity structures in emerging economies. Although both mechanisms are theoretically reasonable, most recent empirical studies report a positive relationship between DL and DEI, particularly in students' contexts. Thus, we propose the following hypothesis:

H6: DL directly and positively affects the DEI among students.

2.4. The moderating role of demographic factors

Demographic characteristics are important background variables influencing cognitive and motivational processes related to entrepreneurial decision-making (Arshad et al., 2025). The influence of gender and family background on entrepreneurial intention among students has been the subject of extensive research (Laouiti et al., 2022; Vu et al., 2025). As this research examines how these two variables moderate the relations between the TPB antecedents and digital entrepreneurial intention. Specifically, we want to understand if and how ATE, SN, and PBC affect DEI differentially based on each individual's demographic background.

2.4.1. Family business background (FBB)

An entrepreneurial family background refers to people whose immediate family, namely parents and/or other close relatives, are involved in one or another form of self-employment. FBB is best understood as a background factor that forms the beliefs underlying ATE, SN and PBC, within the TPB model (Fishbein & Ajzen, 2011). Social Learning Theory (SLT) provides a useful mechanism for explaining this impact; families with business backgrounds are suggested to act as role models who offer the right kind of support to their children, which includes, but is not limited to, motivation, emotional and financial support, an experimental environment, and practical know-how, all of which are vital for promoting an entrepreneurial mindset (Charlie & Ida, 2023). Through observation and informal participation, especially the ones considered role models (Bandura & Walters, 1977), children can learn that entrepreneurship is both desirable and feasible, and they often perceive greater family approval to pursue similar paths. Empirical studies support this TPB-SLT linkage. Students from entrepreneurial families are believed to have a greater tendency to follow their role models and start to view self-employment as a viable career path, thus increasing their attitude to engage in entrepreneurial endeavors (Georgescu & Herman, 2020; González-Ramos et al., 2025). In their narrative review, Kumar et al. (2022) also conclude that FBB can enhance students' entrepreneurial knowledge, confidence, and awareness of opportunities, thereby reinforcing TPB antecedents. These students often perceive fewer barriers when evaluating the feasibility of starting a business. It is therefore reasonable to expect that ATE and PBC are more strongly related to DEI among students with a family business background (González-Ramos et al., 2025). Similarly, family support, whether financial or emotional, has been shown to reinforce Subjective Norms (SN), particularly in collectivist societies where family approval can play a crucial role in big career decisions (Chin et al., 2024). In this respect, students from entrepreneurial families may feel more encouraged to pursue a non-conventional path, like launching a business (Coelho & Lira, 2021).

Nevertheless, the impact of FBB is not always positive. Students who have unpleasant experiences (e.g. strained relationships over money) with family businesses may become risk-averse (Vu et al., 2025). In such cases, FBB becomes a push factor rather than a pull factor (Kumar et al., 2022). These opposing findings suggest that the impact of TPB factors on entrepreneurial intention may not be consistent across all students but may differ depending on whether they come from entrepreneurial families. Therefore, we assume:

FBB strengthens the positive relationships between ATE-DEI (H7a), SN-DEI (H7b), and PBC-DEI (H7c).

2.4.2. The role of gender

Research has paid more attention to the effect of gender on the decision to pursue an entrepreneurial direction. For example, according to Dragin et al. (2022), male students appeared to show higher

entrepreneurial tendencies than female students, which might be because men in nature tend to have higher risk-taking propensity and confidence in their abilities (Vu et al., 2025). Men generally gravitate toward achievement-driven values (e.g. more wealth, higher status) (Sasu & Sasu, 2015). Contrarily, women tend to consider work-life balance and personal well-being as more important priorities (Fernández Cornejo et al., 2018; Maes et al., 2014).

In a different realm, social expectations appear to affect women's DEI more strongly than men's (Fernández Cornejo et al., 2018; Villanueva-Flores et al., 2021). That discrepancy might stem from the belief that entrepreneurship is a 'masculine' quest as it requires many male qualities, such as perseverance and long-term commitment (Maes et al., 2014), while the other researchers (Amofah & Saladrignes, 2022) argue that the lack of female role models discourages women from envisioning themselves as entrepreneurs, and thus increasing their perceived behavioral barriers. To illustrate, in traditional societies, like Jordan, men are expected to be the breadwinners. Thus, their entrepreneurial interests may align with prevailing social expectations (Dragin et al., 2022; Global Entrepreneurship Monitor, 2020). On the contrary, women often receive less support from their surroundings when pursuing entrepreneurial roles. That might be because their desires are being viewed as unusual and, in some cases, culturally unacceptable (Alkhalailah et al., 2023; Aloulou et al., 2024). Those assumptions align with the role congruity theory, which states that a mismatch between group stereotypes and role requirements can lead to bias and perceived incongruence, often lowering women's self-confidence (PBC) and leading them to associate their success with luck or external factors (del Carmen Triana et al., 2024; Haus et al., 2013; Vamvaka et al., 2020). Thus, we propose the following hypotheses:

H8a: Males develop a favorable ATE-DEI relationship than females.

H8b: Females create a stronger SN-DEI relationship than males.

H8c: Males establish a stronger PBC-DEI relationship than females.

As a result, the authors develop a conceptual framework (see [Figure 1](#)).

3. Methodology

3.1. Data collection strategy

Data was collected using a structured questionnaire, through both online and offline self-administered surveys (Krueger & Carsrud, 1993; Liñán & Chen, 2009). In the offline context, the researcher personally visited the selected universities to distribute and collect the surveys in coordination with instructors during or after lectures. Students were informed verbally of the study's purpose, the voluntary nature of participation, and the confidentiality of their responses. Completion and return of the questionnaire were taken as an indication of informed consent. Written consent was not collected in order to maintain anonymity and minimize administrative burden on participants. In the online context, on the other hand, the researchers sent the questionnaire e-version to an instructor who forwarded the link to their students. The data was collected in July 2022 in Jordan using the cross-sectional design. The study was approved by ethics committee of the University of Debrecen, and reg. no. GTK-KB 002/2022, dated 14 April 2022.

3.2. Sampling strategy

Bachelor's business students were chosen as a research population. The justification for choosing this unit is that they often engage in business-related subjects and are at the point of deciding their career paths (Liu et al., 2024; Wardoyo et al., 2025). While students in technical fields (e.g. IT, Engineering) possess the required coding and development skills, technical proficiency alone is not enough for entrepreneurial success. In Jordan, the main problem for digital startups is usually not a shortage of tech skills; it is a lack of viable business modeling, marketing, and financial planning competencies, all of which business schools teach. Therefore, understanding the intentions of business students who are most likely to manage and scale these ventures is essential. According to MOHE (2022), the total population of

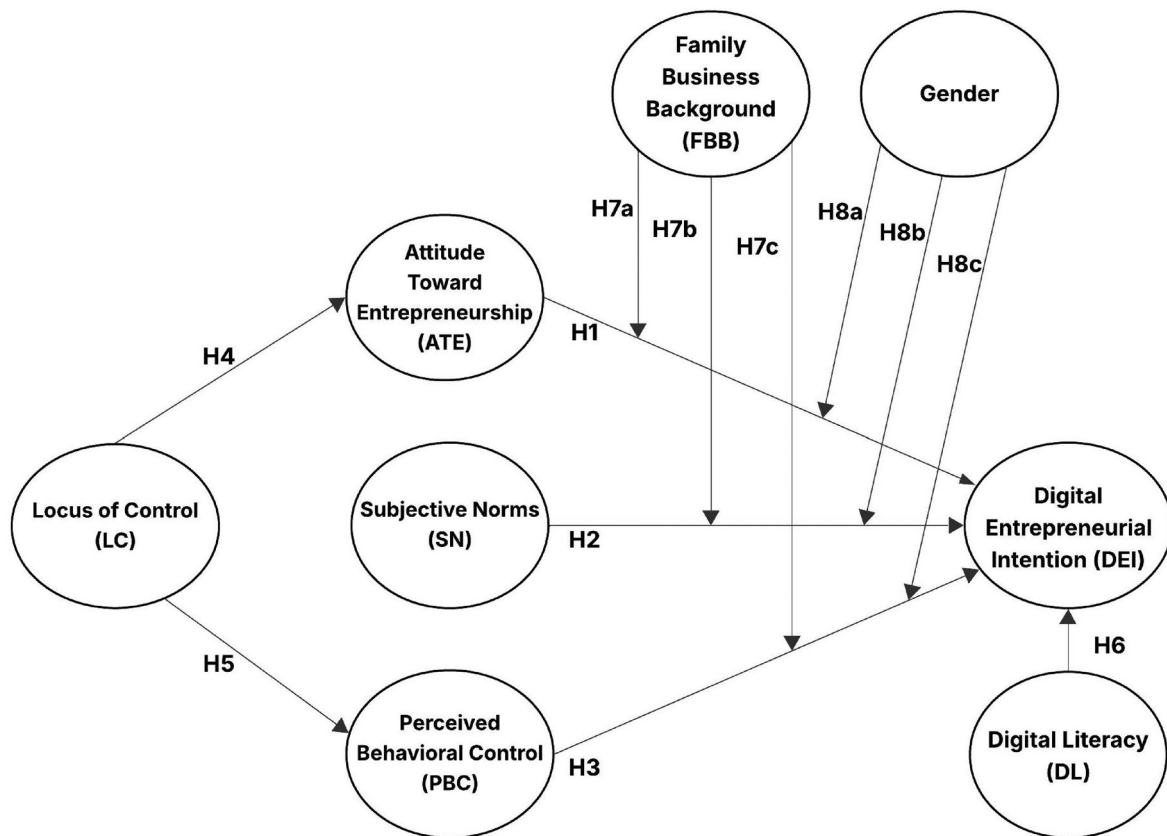


Figure 1. Conceptual framework. *Source:* Created by the authors.

Table 1. Demographic distribution of respondents.

Category	Items	Count	%
Gender	Male	178	44.6
	Female	221	55.4
Age	17–20 years	151	37.9
	21–24 years	216	54.1
	25 years or above	32	8.0
	Total	399	100%
Quota Per University	The University of Jordan (Public)	90	22.6
	Middle East University (Private)	27	6.8
	Philadelphia University (Private)	15	3.8
	Petra University (Private)	36	9.0
	Princess Sumayya University for Technology (Private)	45	11.3
	Al-Ahliyya Amman University (Private)	28	7.0
	Yarmouk University (Public)	103	25.8
	Al Al-Bayt University (Public)	55	13.8
Employment Status	Yes	84	21.1
	No	315	78.9
Previous Business Ownership	Yes	139	34.8
	No	260	65.2
Total		399	100%

Source: Created by authors.

business students is 15,368, distributed across eight universities that offer entrepreneurship education and incubation services. Because we lacked a complete list of all registered students nationwide, we could not use probability sampling. Instead, we used non-probability quota sampling. To keep the sample representative, quotas were assigned to each university based on its student enrollment (see Table 1 represents the final sample students' demographics).

To confirm the sample size was adequate, we used two methods. First, the minimum R-squared method was applied (Kock & Hadaya, 2018). Based on a minimum expected R-squared value of 0.1 and a maximum of 10 predictors, this approach specified that a sample size of 189 was required. Second, to provide further robustness, an a priori power analysis was conducted using G*Power software (Faul et al., 2009). The analysis utilized the F-test for linear multiple regression (fixed model, R²) deviation from zero,

with the following parameters: a medium effect size (f^2) of 0.15, a significance level (α) of 0.05, a high statistical power ($1 - \beta$) of 0.95, and 10 predictors. This calculation indicated a minimum requirement of 172 participants. The final sample of 399 contributors significantly exceeds the thresholds of both methods, confirming that the study possesses sufficient statistical power.

3.3. Instruments and measurements

We used a five-point Likert-scale survey, with all constructs drawn from high-quality publications. The TPB factors (DEI, ATE, SN, and PBC) were borrowed from Liñán and Chen (2009), DL from Ng (2012), and LC from Zellweger et al. (2011). However, we placed the survey's demographic questions (FBB and Gender) separately. It is worth mentioning that some questions were modified to better align with the Jordanian context. The original questionnaire was in English; therefore, the Arabic translation was necessary. Then, the translated version was sent to a group of academic business professors, who provided suggestions that improved its quality.

3.4. Data analysis procedure

To ensure an accurate and clean data analysis process, an Exploratory Factor Analysis (EFA) was conducted to avoid weakening the reliability of the corresponding constructs. The goal was to identify the latent dimensions underlying the theoretical model, where the items with loadings below 0.50 were removed, following Comrey and Lee (2013). Although several indicators were dropped at this stage, the remaining items still captured the intended latent variables and preserved the overall integrity of the measurement structure. A Confirmatory Factor Analysis (CFA) was then performed on the retained item blocks to verify the factor structure suggested by the EFA.

On the other hand, model fit for the CFA was examined using a combination of absolute and incremental indices: chi-square, the Tucker–Lewis Index (TLI) (Tucker & Lewis, 1973), Comparative Fit Index (CFI) (Bentler, 1990), Root Mean Square Error of Approximation (RMSEA) (Steiger, 1990), and the Standardized Root Mean Square Residual (SRMR) (Byrne, 1994). TLI and CFI values of 0.90 or higher were interpreted as indicative of a good model fit, while RMSEA and SRMR values below 0.08 were considered acceptable indicators of model adequacy (Byrne, 1994).

In the following analysis phase, the researchers employed Partial Least Squares Path Modeling (PLS-PM) regression to examine how various influential factors relate to Digital Entrepreneurship Intention (DEI). The PLS algorithm dates back to the 1980s, with initial foundations by Jöreskog and Wold (1982). Subsequent enhancements and applications in path modeling were introduced by Lohmöller (1989), Chin (2010) and Tenenhaus et al. (2004). Within this study, the link between the latent construct and its indicators was specified as reflective, following the approach suggested by Diamantopoulos (1999). To assess the quality of the model, several fit indices were calculated, including global goodness-of-fit (GoF), average variance extracted (AVE), and R^2 (Tenenhaus et al., 2004). Conventionally, an R^2 value above 0.35 (Cohen, 2013) and an AVE exceeding 0.5 are considered strong, while a GoF greater than 0.36 signifies a satisfactory global fit (Wetzels et al., 2009). The model's discriminant validity was further evaluated using the Fornell and Larcker (1981) measure. According to this criterion, each construct's average variance extracted (AVE) must exceed the squared correlations it shares with other constructs. This ensures that each construct captures more variance within itself than it shares with other variables in the model. In order to test parameters (mean and standard errors) and calculate p-values, bootstrapping was applied with 500 samples (Chin, 2010). The SEMinR package was used to estimate PLS-PM using R 4.2.3 software (R Core Team, 2024). EFA, CFA, and McDonald's omega were performed using JAMOVİ 2.6 software (Jamovi, 2025).

4. Results and discussion

4.1. Results

To address the potential issue of Common Method Bias (CMB), we conducted Harman's single-factor test (Podsakoff et al., 2003). All manifest variables used in the PLS model were entered into an exploratory

factor analysis with an unrotated solution, constrained to a single factor. The results indicated that the single factor accounted for 21.3% of the total variance, which is well below the threshold of 50%. Therefore, CMB is not considered a significant concern in this study. Before the PLS-PM model was constructed, EFA and CFA analyses were performed to establish the latent variables (LVs). Table 2 presents the loadings of the EFA and CFA analyses, the model fit measures (TLI, RMSEA, Chi-squared test), and the removed items due to lower loadings. Regarding EFA, the measure of sampling adequacy (MSA) values (greater than 0.5) and Bartlett's test results (p -values below 0.05), the RMSEA value under 0.08 suggest significant association in the data and approve that the variables measured their proposed constructs. In addition, the CFA model confirmed the structure from the EFA analysis as the fit was adequate (TLI and CFI >0.9; RMSEA and SRMR <0.08), and all the loadings were significant at an even 1% significance level.

In the second stage of the analysis, the PLS-PM regression model was fit on (DEI) as the primary endogenous LV. Figure 1 explains the main exogenous role of LC, SN, and DL towards DEI, and ATE and PBC are the moderating LVs between LC and DEI. The other main characteristic of the model is the moderation effect of Family Business Background (FBB) and Gender on ATE, SN, and PBC. These effects were built into the model as interaction effects. In order to establish this, LV scores for ATE, SN, and PBC were saved from the EFA model and multiplied by Gender and FBB, respectively. The conceptual model includes two components: the measurement model, which assesses construct validity and reliability, and the structural model, which evaluates the relationships among the latent variables (Gál et al., 2025). First, Table 3 contains the inner model's parameter estimates and hypothesis testing.

According to Table 3, the model demonstrated acceptable predictive power ($R^2 = 0.562$), indicating that the TPB variables and moderators explained a substantial portion of the variance in DEI. Among the direct predictors, the LV with the greatest direct influence on DEI was ATE ($\beta = 1.335$; $t = 15.60$; $p < 0.001$), followed by PBC ($\beta = 0.386$; $t = 2.78$; $p = 0.006$). ATE and PBC had a positive and statistically significant impact on DEI, thus supporting H1 and H3. In contrast, SN had marginally significant influence on DEI ($\beta = 0.224$; $t = 1.73$; $p = 0.084$), hence H2 was supported. Although Digital Literacy was significantly related to DEI ($\beta = -0.134$, $t = -2.34$, $p = 0.020$), the path coefficient was negative, contradicting the hypothesized positive effect; therefore, H6 was rejected. For the mediating relationships, the R^2 value for PBC (0.088) was acceptable, and for ATE, it was smaller (0.059), but LC was found to positively and significantly influence both ATE ($\beta = 0.242$, $t = 4.45$, $p < 0.001$) and PBC ($\beta = 0.297$, $t = 5.97$, $p < 0.001$), which supports H4 and H5.

In terms of moderation, FBB had a significant moderating effect on all TPB–DEI relationships: ATE ($\beta = -0.263$, $t = -2.63$, $p = 0.009$), SN ($\beta = -0.249$, $t = -2.54$, $p = 0.011$), and PBC ($\beta = -0.211$, $t = -2.06$,

Table 2. Explanatory and confirmatory factor analyses results.

Item ^a	Manifest variables	Latent variable (LV)	Loading (EFA) ^b	CFA results ^c		
				Loading	Standard error	Z-statistic ^d
Start an Online venture	DEI1	Digital Entrepreneurship	0.501	0.579	0.043	11.37
Have serious doubts	DEI3	Intention (DEI)	0.588	0.574	0.047	11.66
Digital company	DEI4		0.814	0.937	0.044	19.50
Different technologies	DL2	Digital Literacy (DL)	0.751	0.766	0.045	16.10
Latest technologies	DL3		0.716	0.753	0.043	15.78
Learn new technologies	DL4		0.547	0.586	0.039	11.51
Technical skills	DL5		0.514	0.611	0.043	12.04
Attractive as a career	ATE2	Attitude Toward	0.573	0.644	0.039	12.76
Great satisfaction	ATE4	Entrepreneurship (ATE)	0.774	0.735	0.040	14.94
A good option	ATE5		0.602	0.746	0.045	15.19
Approval of family	SN1	Subjective Norms (SN)	0.591	0.630	0.044	11.77
Approval of friends	SN2		0.745	0.753	0.041	14.09
Approval of peers	SN3		0.681	0.691	0.045	13.05
Practical details	PBC1	Perceived Behavioral	0.702	0.742	0.048	15.35
Control of the process	PBC2	Control (PBC)	0.702	0.761	0.044	15.80
Ease of operating a firm	PBC3		0.675	0.722	0.048	14.87
Behaviour control	LC1	Locus of Control (LC)	0.551	0.490	0.057	7.65
Plans will be realized	LC2		0.520	0.544	0.048	8.10
Personal agency	LC3		0.491	0.597	0.066	8.71

Source: Created by the authors.

^aLoading (EFA).

^bCFA results.

^cItem.

^dZ-statistic.

Table 3. Bootstrapped structural paths and hypothesis testing of the inner PLS-PM model.

Effect ^a	Path coefficient ^b	Bootstrap estimation	Standard error	t-statistic	p-value	Supported?
Direct (DEI: R ² =0.562)						
ATE→DEI	1.335	1.325	0.086	15.60	<0.001	H1: Yes
SN→DEI	0.224	0.220	0.130	1.73	0.084	H2: Yes
PBC→DEI	0.386	0.375	0.139	2.78	0.006	H3: Yes
DL→DEI	-0.134	-0.128	0.056	-2.34	0.020	H6: No
Mediation						
LC→ATE (R ² =0.059)	0.242	0.243	0.055	4.45	<0.001	H4: Yes
LC→PBC (R ² =0.088)	0.297	0.303	0.050	5.97	<0.001	H5: Yes
Moderation (Gender)						
(Gender)X(ATE)→DEI	-0.760	-0.751	0.099	-7.65	<0.001	H8a: Yes
(Gender)X(SN)→DEI	-0.116	-0.125	0.097	-1.19	0.235	H8b: No
(Gender)X(PBC)→DEI	-0.200	-0.196	0.105	-1.91	0.056	H8c: No
Moderation (Family Business Background)						
(FBB)X(ATE)→DEI ^c	-0.263	-0.263	0.100	-2.63	0.009	H7a: Yes
(FBB)X(SN)→DEI ^c	-0.249	-0.230	0.098	-2.54	0.011	H7b: Yes
(FBB)X(PBC)→DEI ^c	-0.211	-0.205	0.103	-2.06	0.040	H7c: Yes

Note: Created by the authors.

^aAbbreviations can be found in Table 2.

^bInsignificant results were denoted in italics.

^cFBB=Family Business Background.

$p=0.040$). These findings indicate that the strength of the relationships between TPB antecedents and DEI was greater for students with an entrepreneurial family background, thereby supporting H7a, H7b, and H7c. Regarding gender, only the moderation effect on the ATE–DEI path was significant ($\beta = -0.760$, $t = -7.65$, $p < 0.001$), indicating a stronger relationship for male students and supporting H8a. However, its moderating effects on SN–DEI ($\beta = -0.116$, $t = -1.19$, $p = 0.235$) and PBC–DEI ($\beta = -0.200$, $t = -1.91$, $p = 0.056$) relationships were not statistically significant, thus, H8b and H8c were rejected.

Table 4 provided information on various statistical measures for the LVs related to the outer model (Table 2) linking items to their LVs. It is necessary to validate the reliability of the studied LVs and further assess the characterized model. Composite reliability measures the proportion of shared variance among items belonging to an LV. The loading value tells how strongly each item is linked with its respective latent variable. The standardized regression weights indicate the importance of each item in predicting its LV. VIF values were used to measure the multicollinearity of the observed items.

No significant multicollinearity issues were observed, as the VIF values were lower than 3.0. High t-statistics indicated significant relationships ($p < 0.001$); the threshold is 1.96. A decent convergent validity was assumed because AVE values exceeded 50%. In line with this, composite reliability was also appropriate, as all values ranged from 0.7 to 0.9. According to Table 4, all latent variables comply with the required AVE and composite reliability thresholds, which confirm strong convergent validity and internal consistency. The authors also investigated Fornell and Larcker's (1981) test for discriminant validity. The criterion supported discriminant validity, as the AVE for each LV exceeded the squared correlations between that LV and other LVs. These results (Tables 2 and 3) suggested that LVs in the model showed reliability and stability measurements of the fundamental theoretical concepts, and the model had a good global fit of 0.383, exceeding the threshold of 0.36.

4.2. Discussion

As follows are the findings of this study, in accordance with the research questions to be discussed: First, ATE emerged as the strongest predictor of DEI, aligning with TPB's central assumption that intention is primarily driven by how individuals evaluate a behavior; whether they see it as attractive and worthwhile (Ajzen, 1991). In our context, students who view entrepreneurship as a desirable career path are more inclined to imagine themselves running an online venture, to interpret digital technologies as opportunities rather than threats, and to perceive self-employment as a viable response to Jordan's difficult labor market conditions, consistent with recent evidence showing that favorable ATE promote opportunity exploration and risk-taking among students engaging with digital business models (Lopes et al., 2025; Wardoyo et al., 2025). Our findings extend this literature by showing that, even in a high-unemployment, resource-constrained

Table 4. Construct validity and reliability for the outer model.

Construct	Loading ^a ≥ 0.4	Outer ^a weights	VIF < 3.0	t-statistics > 1.96	AVE ≥ 0.5	Composite reliability ≥ 0.6
Digital entrepreneurship					64.7%	0.845
DEI1	0.733	0.334	1.408	19.21		
DEI3	0.776	0.393	1.423	23.51		
DEI4	0.896	0.502	1.786	94.87		
Digital Literacy					58.5%	0.874
DL2	0.736	0.219	1.766	14.42		
DL3	0.756	0.285	1.744	17.76		
DL4	0.789	0.424	1.373	17.53		
DL5	0.759	0.370	1.378	18.06		
Attitude Toward Entrepreneurship					67.7%	0.857
ATE2	0.780	0.377	1.421	24.76		
ATE4	0.838	0.404	1.638	36.36		
ATE5	0.830	0.441	1.516	38.46		
Subjective Norm					65.0%	0.848
SN1	0.801	0.444	1.365	15.27		
SN2	0.817	0.412	1.529	17.64		
SN3	0.787	0.379	1.478	16.71		
Perceived Behavior Control					69.8%	0.806
PBC1	0.809	0.337	1.652	26.65		
PBC2	0.871	0.468	1.686	57.44		
PBC3	0.822	0.387	1.595	29.76		
Locus of Control					52.4%	0.766
LC1	0.615	0.309	1.161	8.02		
LC2	0.724	0.458	1.167	12.01		
LC3	0.805	0.580	1.150	18.36		

Note: Created by the authors.

^aBootstrap estimated.

setting, it is not digital skills alone but the valuation of entrepreneurship as a personally rewarding option that most strongly drives students' readiness to start a digital business. Second, SN showed a modest, positive effect on DEI, with marginal significance. This pattern is broadly consistent with TPB, which posits that perceived approval from significant others, such as family and peers, can encourage or discourage engagement in a given behavior (Ajzen, 1991). In this sense, students who perceive that the people whose opinions they value are supportive of entrepreneurship are somewhat more inclined to consider launching a digital venture, even though this social pressure is clearly weaker than the influence of their own attitudes and perceived control. Recent work in emerging and collectivist settings similarly finds that normative support contributes to entrepreneurial intention, but often with a smaller effect size than ATE and PBC (Chin et al., 2024; González-Prida et al., 2024). Our findings also resonate with studies arguing that, as entrepreneurial careers become more visible and normalized, SN may lose part of their explanatory power relative to personal evaluations of desirability (Tchokoté et al., 2025). Taken together, the results suggest that while social endorsement still matters for digital entrepreneurship in Jordan—particularly given the centrality of family and close networks—it does not, on its own, drive intentions. Instead, SN appears to play a complementary role, reinforcing but not replacing students' internal motivations and efficacy beliefs in shaping their digital entrepreneurial intentions. Third, PBC plays the second strongest role in shaping DEI, consistent with TPB, which conceptualizes PBC as individuals' beliefs about their capability and control over performing a behavior. In our sample, students who feel able to mobilize the necessary skills, resources and effort are more inclined to intend digital entrepreneurship, suggesting that feasibility perceptions are almost as critical as desirability, aligning with recent studies (Kariv et al., 2024; González-Prida et al., 2024). In a labor market like Jordan's, where formal employment opportunities are scarce and uncertainty is high, students' perceived capacity to manage risk, leverage digital tools and navigate regulatory and market hurdles becomes a decisive factor in whether digital venturing is even considered a real option. Our results therefore, reinforce the view that interventions aimed at fostering digital entrepreneurship cannot rely on attitude change alone; they must also build students' confidence in their practical ability to create, launch and sustain digital businesses through skill development, mastery experiences and structured support. Fourth, contrary to earlier studies (Akhter et al., 2022; Salimi et al., 2025), DL had a negative effect on DEI. Conceptually, DL was expected to reduce technical barriers to starting online businesses by enhancing students' ability to use digital tools for communication and value creation (Liang et al., 2025). The unexpected negative result may be attributed to that students with higher DL prefer more attractive and less

risky career paths (Gunathilaka & Samaraweera, 2021). The Opportunity Cost Theory can offer a possible explanation. It defines the cost of any action not by the direct monetary expense, but by the value of the best alternative that is forgone when that choice is made. Thus, students with high digital literacy are highly employable in the job market and in a high-unemployment context like Jordan, these skilled individuals often prefer the security and high salaries of corporate tech jobs over the uncertainty of entrepreneurship. Thus, because these students have lucrative, stable employment options, the opportunity cost of rejecting those jobs to start a risky, uncertain digital venture is extremely high. Therefore, DL alone does not seem to motivate students in Jordan—who grew up amid a high-tech environment—to pursue digital entrepreneurship. We argue that those students need more than just technical know-how to take that leap (Alkhalailah et al., 2023; Kulikowski et al., 2022). Fifth, the role of LC appeared to be indirectly influential on both ATE and PBC. These results align with the studies by Tseng et al. (2022) and Anwar et al. (2021), which underline that LC first improves entrepreneurial cognition. In other words, personality traits are assumed to act as background players that impact beliefs and perceptions, which, in turn, form the behavioral intentions (Tan et al., 2021; Zhuang et al., 2022). Thus, students with high LC tend to take full responsibility for their lives and avoid playing the victim to external circumstances. In a high-uncertainty labor market such as Jordan's, this is particularly important: when formal opportunities are scarce and risk is salient, feeling in control of one's future becomes a psychological lever through which attitudes and control beliefs translate into digital entrepreneurial intention. Sixth, FBB appeared to have a positive moderating effect on the relationships between ATE, SN, PBC, and DEI. These results suggest that being raised in a family with an entrepreneurial background can boost confidence and the perceived desirability of entrepreneurship as a career direction (González-Ramos et al., 2025). Social learning theory can help explain this pattern. Students who grow up in families who run businesses are repeatedly exposed to entrepreneurial routines, narratives and problem-solving, which normalize self-employment and provide vicarious mastery experiences (Bandura & Walters, 1977). For students without a family business background, favorable attitudes or perceived capability may remain more abstract or fragile, and thus less likely to crystallize into concrete plans. In the Jordanian context—where uncertainty is high and failure can be socially costly—having an entrepreneurial family appears to provide both a psychological safety net and practical guidance that make it easier to act on one's beliefs and commit to starting a digital venture. As earlier research often treats FBB as a control variable rather than a moderator, this research contributes to the literature body by addressing this oversight (Charlie & Ida, 2023; Kumar et al., 2022).

Gender, as a second demographic factor, seemed only to moderate the ATE–DEI relationship, with a stronger effect in males. These results align with role congruity perspectives, which argue that entrepreneurship is still widely coded as a masculine domain, making entrepreneurial careers more compatible with men's socially prescribed roles than with women's (Dewantara et al., 2024; Laouiti et al., 2022). In such contexts, male students who already view entrepreneurship positively face fewer identity conflicts and social approval, and therefore more easily convert favorable attitudes into concrete intentions. By contrast, female students may hold similarly positive views of entrepreneurship but anticipate greater structural and normative barriers, such as limited role models, weaker support, or expectations around caregiving, which can reduce the impact of their attitudes on intention (González-Ramos et al., 2025). Despite these findings, gender does not change the SN–DEI connection, suggesting that social approval appears to function similarly for both male and female students. That aligns with studies in developing countries, which prove that when the overall environment supports entrepreneurship, approval shapes the intentions of both genders (Çela et al., 2024; Nguyen & Nguyen, 2024). In collectivist and tightly knit societies, such as Jordan, family expectations and community perceptions carry substantial weight for young people regardless of gender. In this context, entrepreneurship is still not a fully normalized career path, and students—both male and female—may hesitate to pursue it unless they feel that parents and close networks 'stand behind' that choice.

Similarly, gender did not moderate the PBC–DEI relationship, indicating that once students feel capable of starting a digital business, this sense of capability translates into entrepreneurial intention in a similar way for both men and women. Previous studies often report gender gaps in the level of PBC or self-efficacy—women tend to underestimate their skills and perceive more barriers (Maes et al., 2014; Vamvaka et al., 2020)—but find that, when women do feel efficacious, PBC predicts their intentions as strongly as it does for men (Fernández Cornejo et al., 2018; Villanueva-Flores et al., 2021). In a university

setting where male and female students follow similar business curricula and are exposed to the same digital tools and entrepreneurial content, it is plausible that once both groups reach comparable levels of perceived control, they respond in much the same way in terms of digital entrepreneurial intention.

That may be because men often do not care much about seeking approval from society and rely more on internal motivations (Fernández Cornejo et al., 2018; Laouiti et al., 2022). Besides, because of their role in providing for their families, men often see entrepreneurship as an attractive option for fulfilling this responsibility (Maes et al., 2014; Villanueva-Flores et al., 2021).

5. Conclusion

5.1. Conclusion

Digital technologies offer many opportunities for both individuals and nations. These opportunities including, but not limited to the creation of online jobs, help reduce the unemployment rate and increase the sense of patriotism among citizens. Therefore, the study set out to explain how psychological, digital and background factors shape digital entrepreneurial intention among undergraduate business students in Jordan, a context characterized by high youth unemployment and growing policy emphasis on digital entrepreneurship.

The results confirm the core logic of TPB in the digital domain, but with important nuances. Attitudes toward entrepreneurship, along with perceived behavioral control, emerged as a significant positive predictor of DEI. Concurrently, SN had a positive but only marginally significant effect, suggesting that social approval still matters, but is less decisive than internal evaluations of desirability and control. LC appeared to strengthen ATE and PBC, confirming its role as a background personality factor that operates through TPB antecedents. Interestingly, our study challenges the common assumption that DL directly promotes entrepreneurship. It suggests DL has a negative bond with DEI. Lastly, family background appears to have a powerful moderating effect on the relationships among the three factors of TPB and DEI. Gender, on the other hand, showed only significant moderation only on the ATE–DEI relationship, which may explain the assumption that males are more likely to convert favorable attitudes into entrepreneurial intentions, as females might face other social and psychological challenges.

5.2. Theoretical implication

The study contributes to the current literature in three ways. First, it extends TPB to the field of digital entrepreneurship in a developing economy driven by necessity. It shows that its core structure remains valuable but that the importance of its factors can be context sensitive. Second, it clarifies the role of locus of control as a background driver of TPB beliefs. Simultaneously, it represents that digital literacy is an ambivalent factor that can either support or divert entrepreneurial intention, depending on the opportunity structure. Third, it shows that gender and family business background are better understood as conditioning mechanisms within TPB, not direct predictors, thereby offering a more nuanced account of inequality in access to entrepreneurial pathways.

5.3. Practical implications and recommendations

First, given that the cognitive internal factors (ATE and PBC) appear to be the strongest predictors, promoting entrepreneurship as an attractive career option and increasing students' self-efficacy are essential. That can be achieved by organizing networking events with successful entrepreneurs and sharing their success stories. Additionally, offering experiential learning opportunities can help students perceive entrepreneurship as feasible and rewarding. Second, the unpredicted negative relationship between DL and DEI implies that digital competencies alone may be insufficient. Thus, it is indispensable to teach digital skills in a business-creation context rather than as a standalone curriculum. Third, family engagement can help students develop the right entrepreneurship attitudes and skills and increase the likelihood of launching online startups; therefore, universities are suggested to organize events to educate family members and highlight their role in strengthening support outside the classroom. Fourth, female

students appear less likely to act on their positive attitudes toward entrepreneurship. To close this gap, institutions are encouraged to launch initiatives for women, such as role-model exposure and confidence-building workshops, to help them overcome societal and internal barriers.

5.4. Study limitations

First, the sample included only undergraduate business students in Jordan, which might limit our ability to generalize the conclusions to students from other faculties, at other educational levels, or from other countries. Future studies are advised to look into more diverse populations. Second, the cross-sectional technique captures a snapshot at a single point in time. We collected the data during the summer semester of July 2022. Summer enrolment also tends to attract a somewhat self-selected group of students (e.g. those catching up on courses or accelerating their studies), which may not fully reflect the broader student population. As a result, both the level of digital entrepreneurial intention and the strength of its predictors may partly reflect temporary economic conditions and semester-specific dynamics rather than stable patterns over time. Longitudinal studies and repeated measurements across different academic terms and economic cycles would be needed to verify whether the relationships observed here persist in more stable or different contexts. Third, the measurement of digital literacy may not encompass all sub-dimensions within the construct, which may explain the negative correspondence between DL and DEI. Future research is suggested to refine this construct to assess comprehensive digital skills. Finally, the analysis was limited to Locus of Control as the single personality construct. Upcoming studies are advised to include additional traits, like readiness to use AI, fear of failure, AI literacy, and autonomy, to create a more inclusive model. Even with these boundaries, the present work provides a valuable foundation for advancing richer and more contextually grounded models of digital entrepreneurship.

Ethics statement

All study procedures were conducted by the Declaration of Helsinki. The protocol was reviewed and approved by the Research Ethics Committee of the University of Debrecen, with the number GTK-KB 002/2022. Informed consent was obtained from all participants prior to the study.

Author contributions

CRedit: **Mohammad Younis Alkhalailah**: Conceptualization, Data curation, Investigation, Methodology, Writing – original draft, Writing – review & editing; **Sándor Kovács**: Data curation, Formal analysis, Methodology, Software, Validation, Visualization; **Tímea Gál**: Project administration, Supervision, Writing – review & editing.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

Available from the corresponding author upon reasonable request.

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