
FROM ENTREPRENEURSHIP EDUCATION TO ACTION: THE CENTRAL ROLE OF PRO-AUTONOMY ENTREPRENEURIAL OPPORTUNITY RECOGNITION AND THE SUPPORTING ROLE OF BRICOLAGE

David Sukardi Kodrat
Ciputra Surabaya University,
Indonesia
david.kodrat@ciputra.ac.id

Melinda Alfiani Rosida Dewi
Ciputra Surabaya University,
Indonesia
melinda.dewi@ciputra.ac.id

Christina Whidya Utami
Ciputra Surabaya University,
Indonesia
whidyautami@ciputra.ac.id

Abstract

The persistent gap between entrepreneurial intention and action remains a central challenge in entrepreneurship research. This study examines how entrepreneurship education (EE) is translated into entrepreneurial action (EA) by introducing pro-autonomy entrepreneurial opportunity recognition (PEOR) as a missing cognitive mechanism and entrepreneurial bricolage (EB) as its behavioral complement. Drawing on Social Cognitive Theory and the Resource-Based View, we propose a dual-pathway model in which EE fosters autonomous opportunity recognition, while knowledge integration capability (KIC) enhances resource-improvisational behaviors. The data in this study was from 170 alumni of the Wirausaha Merdeka program. We employed structural equation modelling to test the proposed model. We found that PEOR is the strongest predictor of EA, indicating that action

emerges when opportunities are internalized meaningfully and when the action is aligned with one's capability base. EB provides an additional, resource-based pathway that translates knowledge integration into concrete entrepreneurial steps. These findings complement prior studies by positioning PEOR as an unaddressed mechanism, explaining how education initiates action, while at the same time offering practical guidance for designing autonomy-supportive, experimentation-oriented entrepreneurial curricula in the context of developing-countries.

Key Words

Entrepreneurship education; knowledge integration; entrepreneurial bricolage; pro-autonomy entrepreneurial opportunity recognition; entrepreneurial action.

INTRODUCTION

Schumpeter (1942) argued that entrepreneurship drives both economic growth and job creation. Despite this widely acknowledged role, Indonesia continues to face significant structural constraints that limit entrepreneurial capacity. Its national entrepreneurship rate was only 3.47%, a figure well below Malaysia (5%), Thailand (4.5%), and Singapore at 7% (GEM, 2023/24). According to KADIN (2023), Indonesia has more than 66 million Micro, Small, and Medium Enterprises (MSMEs), an enormous sector that contributes about 61% to the GDP. Even so, many of these firms fall into necessity-driven entrepreneurship. People run businesses mainly to cope with economic pressure rather than to pursue innovative ideas (Larso & Saphiranti, 2016). In that sense, the challenge is not simply about having fewer entrepreneurs. It concerns the nature of opportunities they pursue, the level of innovation involved, and whether those efforts support long-term development rather than short-term survival (Reynolds et al., 2005).

Higher education plays a strategic role in shifting this situation, in a way that the academy environment can cultivate an entrepreneurial mindset grounded in knowledge, creativity, and cross-disciplinary collaboration (Bae et al., 2014; Nabi et al., 2017; Walter & Block, 2016). Even so, existing research note that entrepreneurship education in Indonesia remains largely theoretical. It is often detached from real-world practice in helping students develop the skills needed to recognize and act on opportunities (Utami, 2021; Othman et al., 2020). This issue mirrors global observations showing that entrepreneurship programs frequently struggle to connect conceptual understanding with opportunity-driven entrepreneurial action (Neck & Corbett, 2018; Rideout & Gray, 2013). Responding to this gap, the government introduced the Wirausaha Merdeka (WMK) initiative. This program is a cross-disciplinary experiential learning model that emphasizes project-based activities, mentoring from industry practitioners, market

validation, and the early stages of business development (Kemdikbudristek, 2023; Kolb, 1984). The introduction is structured to move logically from national entrepreneurial challenges toward the underlying theoretical problem, ensuring a clear and direct connection between context and model development. This approach aligns with recommendations in academic writing and theory-building literature, which emphasize that an introduction should progressively narrow from broad contextual issues to a focused theoretical gap to justify the proposed model (Whetten, 1989; Locke & Golden-Biddle, 1997; Torraco, 2016).

In this context, this study introduces a construct that is referred to Pro-Autonomy Entrepreneurial Opportunity Recognition (PEOR). The term describes students' autonomous capacity to identify and prioritize opportunities that match their personal values as well as their readiness to act. PEOR extends the more conventional view of opportunity recognition (Baron, 2006; Shane & Venkataraman, 2000) by incorporating elements of agency and value internalization, which are central to Self-Determination Theory (Deci & Ryan, 2017). With these additional dimensions, PEOR functions as a cognitive trigger that helps explain how students move from learning to entrepreneurial action, consistent with metacognitive views of entrepreneurial judgment in experiential learning contexts such as WMK (Haynie et al., 2010).

This study positions knowledge integration capability (KIC) as a cognitive foundation that enables students to combine insights from different disciplines while interpreting potential opportunities. Prior literature emphasizes that the integration of knowledge is a crucial prerequisite for innovation, creativity, and decision-making, especially in uncertain or ambiguous environments (Grant, 1996; Zahra & George, 2002). In line with this view, PEOR is seen as a trigger that can encourage entrepreneurial bricolage, an improvisational behavior in which individuals creatively use whatever limited resources they have at hand (Senyard et al., 2014). Bricolage becomes particularly relevant for novice entrepreneurs who must operate under conditions of resource scarcity.

This study examines a model that clarifies how entrepreneurship education and knowledge integration capability are translated into entrepreneurial action through the sequential mechanisms of PEOR and entrepreneurial bricolage. This model directly addresses the persistent intention–action gap highlighted in the recent literature. The findings are expected to offer an empirical foundation for designing more effective curricula and policy interventions that can support the shift from intention to action, both in Indonesia and in other developing economies.

LITERATURE REVIEW

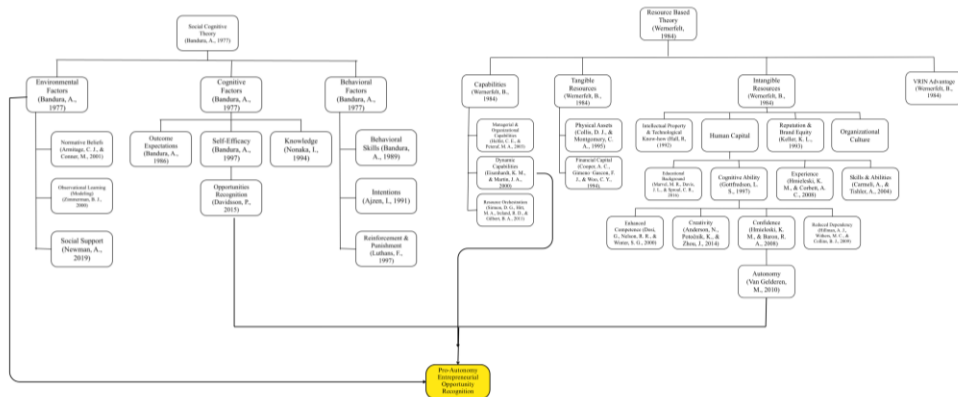
The concept of pro-autonomy entrepreneurial opportunity recognition (PEOR)

Early research on entrepreneurial opportunity recognition (OR), especially the work of Shane and Venkataraman (2000), treats opportunities as external conditions that individuals more or less “discover,” provided they are alert to shifts in markets, technology, or customer needs. While the model has shaped the field, its emphasis lies mainly on external cues such as customer needs, markets, etc. As a result, the model leaves less room for factors such as personal agency, value commitments, or the ways how individuals use their prior knowledge base to decide which opportunities they actually want to pursue (Gaglio & Katz, 2001; DeTienne & Chandler, 2007). Over the past decade, however, studies have noted that opportunity recognition is not a single cognitive act but it is a multidimensional process. It is influenced by human capital, reasoning patterns, and even the ability to draw from different areas of knowledge (De Carolis & Saporito, 2006; Foo, 2011; Schlichte & Junge, 2024). Despite these developments, much of the literature still casts individuals as evaluators of opportunities rather than as autonomous actors who choose opportunities that align with what they consider meaningful.

These limitations point to integrating the idea of opportunity recognition by accounting for the dimensions of autonomous agency and an individual’s capability base. Previous studies have shown that the choice to pursue an opportunity is shaped not only by external conditions but also by self-endorsement, autonomous motivation, and a person’s sense of competence (Deci & Ryan, 2000; McMullen & Shepherd, 2006; Van Gelderen, 2010). At the same time, the capacity to integrate knowledge from different disciplines becomes important when individuals judge whether an opportunity fits with what they know and can actually do (Grant, 1996; Zahra & George, 2002). Despite these insights, the OR literature has not fully combined these two dimensions into a single framework one that explains how individuals autonomously choose the opportunities they consider as meaningful and how they prepare themselves to act on those choices.

To address this theoretical gap, this study proposes introduces the construct of Pro-Autonomy Entrepreneurial Opportunity Recognition (PEOR) as an extension of the traditional OR model. PEOR refers to an individual’s autonomous capacity to identify, evaluate, and then prioritize opportunities that align with personal values. With a cross-disciplinary knowledge base, Individual more ready to be acted upon the opportunities. The concept combines two theoretical streams in a more mechanistic way. The first is Social Cognitive Theory (SCT), which helps explain why individuals gravitate toward certain opportunities through mechanisms such as self-efficacy, autonomous motivation, and self-regulatory cognition (Bandura, 1986; Deci & Ryan, 2000). The second is Resource-Based Theory (RBT), which focuses on how people judge the relevance of opportunities by examining their internal capabilities, particularly their ability to integrate and orchestrate knowledge to create value (Barney, 1991; Teece et al., 1997). In other words, PEOR views opportunity recognition not as a passive or merely perceptual process, but as a reflective one rooted in agency and capability as shown in Figure 1.

Figure 1: Theoretical synthesis of the formation of the pro-autonomy entrepreneurial opportunity recognition (PEOR) construct



The integration of SCT and RBT within the PEOR framework directly addresses earlier limitations that these two perspectives rarely connect autonomous motivation with an individual’s knowledge based capability. From SCT’s standpoint, PEOR draws the psychological dimension that explains why individuals endorse certain opportunities and not others while from RBT’s perspective, PEOR gains the idea that evaluating an opportunity depends on a person’s capacity to combine, interpret, and apply knowledge from different domains (Grant, 1996; Ployhart & Moliterno, 2011). Historically, SCT and RBT evolved in separate research streams, where SCT focused on internal cognitive processes and behavioral self-regulation (Bandura, 1986; Wood & Bandura, 1989), while RBT emphasized firm-level resource heterogeneity and capability deployment as drivers of competitive advantage (Barney, 1991; Wernerfelt, 1984). Because these theories were developed to answer different analytical questions individual agency versus organizational resource orchestration they rarely interacted conceptually (Alvarez & Busenitz, 2001; Foss, 2011). This separation left a theoretical gap in explaining how personal agency intersects with capability judgments in opportunity selection, a gap increasingly noted in entrepreneurial cognition literature (Mitchell et al., 2002; Shepherd, 2015). Bringing these two views together creates a more complete theoretical mechanism. Opportunities that are chosen autonomously and that fit with one’s capability base are more likely to be followed by action. In this sense, PEOR helps form a conceptual bridge between entrepreneurial intention and actual behavior (McMullen & Shepherd, 2006; Nabi et al., 2017).

Thus, PEOR provides an important conceptual refinement by framing opportunity recognition as the product of an interaction between autonomous agencies and the capability to integrate knowledge. This perspective helps address the limitations of the classical OR view, which tends to emphasize external cues while overlooking the internal processes that shape whether an opportunity is genuinely ready to be acted upon. In this framework, PEOR

acts as a cognitive mechanism that comes before entrepreneurial action and explains how entrepreneurship education shapes actual behavior.

Entrepreneurial action as the behavioral outcome

Entrepreneurial action represents the most critical stage of the entrepreneurial process since opportunities generate real, realized value such as products, services, market validation outcomes, or tangible economic/social benefits when they are acted upon (McMullen & Shepherd, 2006; Frese & Gielnik, 2023). Yet, much of the entrepreneurship literature remains focused on intention, with only a fraction of individuals successfully translating their intentions into actual behavior commonly referred to as the intention–action gap (Kautonen et al., 2015; Tsou et al., 2023). Among students, entrepreneurial action is commonly understood as a sequence of iterative activities starting from ideation and moving through market validation, prototype development, experimentation, and, eventually, business launch (Frese & Gielnik, 2023). Prior studies have shown that action is an enactment process that depends on the interplay between cognition, motivation, and the creative use of available resources (Baluku et al., 2020). For this reason, the gap between intention and action is not merely a behavioral issue. It also involves the capability to select the right opportunities and to use resources adaptively, a theoretical space that the constructs of PEOR and bricolage in this study aim to address.

Entrepreneurship education, pro-autonomy entrepreneurial opportunity recognition, entrepreneurial action

Previous studies have consistently shown that entrepreneurship education improves students' ability to recognize and assess opportunities through experiential learning, mentoring, business incubation, and direct interaction with the market (Bae et al., 2014; Fayolle & Gailly, 2015; Nabi et al., 2017). These learning experiences not only increase alertness but also support students' reflective processes in evaluating the suitability of opportunities with their interests, personal values, and capabilities (Souitaris et al., 2007; Shepherd et al., 2013). The literature shows that exposure to entrepreneurial experiences fosters autonomous motivation to choose opportunities that are personally meaningful (Tang et al., 2012; Deci & Ryan, 2017). Thus, entrepreneurship education not only hones the ability to detect opportunities but also increases students' autonomous capacity to select and prioritize opportunities that are relevant to them based on, PEOR.

H1: Entrepreneurship education has a positive effect on pro-autonomy entrepreneurial opportunity recognition.

PEOR serves as a psychological mechanism that connects the process of recognizing opportunities with the decision to engage in entrepreneurial action. When individuals identify opportunities autonomously, drawing on their personal values, intrinsic interests, and competencies, they tend to form

a stronger commitment to pursue those opportunities (Deci & Ryan, 2000; Van Gelderen, 2010). Prior research also notes that opportunities viewed as “personally meaningful” can strengthen goal clarity, increase perceived control, and enhance a person’s willingness to act despite uncertainty (McMullen & Shepherd, 2006; Baron, 2006). In addition, opportunities that fit with an individual’s identity and capability base are more likely to translate into concrete experimentation, whether through market validation, prototyping, or early-stage business activities (Frese & Gielnik, 2023; Dimov, 2007). For these reasons, PEOR is expected to function as a strong predictor of entrepreneurial action.

H3: Pro-autonomy entrepreneurial opportunity recognition has a positive effect on entrepreneurial action.

A number of studies confirm that entrepreneurship education does not directly result in action, but works through psychological and cognitive mechanisms such as opportunity evaluation, self-efficacy, and self-reflection (Souitaris et al., 2007; Nabi et al., 2017; Walter & Block, 2016). Entrepreneurship education enhances students' ability to assess the relevance of opportunities based on coherence with personal values and internal capabilities (Gielnik et al., 2017). Because PEOR reflects the selective capacity to choose opportunities that are most meaningful and feasible for oneself, PEOR serves as a bridge connecting the learning process (EE) with action (EA). In other words, students are motivated to act when the opportunities they identify are opportunities they believe in, value, and are capable of executing a process facilitated by PEOR.

H5: Pro-autonomy entrepreneurial opportunity recognition mediates the relationship between entrepreneurship education and entrepreneurial action.

Knowledge integration capability, entrepreneurial bricolage, entrepreneurial action

The ability to integrate cross-disciplinary knowledge enables individuals to understand problems comprehensively, identify new relationships between pieces of information, and generate creative solutions amid limited resources (Grant, 1996; Zahra & George, 2002). In the context of entrepreneurship, knowledge integration is an important foundation because the process of creating a business frequently takes place in conditions of uncertainty, ambiguity, and resource scarcity (Sarasvathy, 2001; Alvarez & Barney, 2007). Individuals with high knowledge integration capability (KIC) are better able to perform resource recombination, combining experience, networks, and knowledge from various domains, which are key prerequisites for entrepreneurial bricolage, i.e., improvisation and creative utilization of available resources (Baker & Nelson, 2005; Senyard et al., 2014). Recent empirical findings also confirm that knowledge integration strengthens individuals' tendency to engage in resource-constrained experimentation

and creative adaptation (Davidsson et al., 2018; Clauss et al., 2021). Therefore, KIC is expected to increase the level of individual involvement in bricolage behavior.

H2: Knowledge integration capability has a positive effect on entrepreneurial bricolage.

Entrepreneurial bricolage has been identified as an important mechanism that supports entrepreneurial action, particularly in situations where optimal resource configurations are difficult to secure (Baker & Nelson, 2005; Desa & Basu, 2013). By improvising and recombining whatever resources are available, individuals can move more quickly toward action, whether that involves building simple prototypes, validating ideas with potential users, testing basic business models, or running small-scale market experiments (Senyard et al., 2014; Davidsson et al., 2018). Bricolage also encourages individuals not to postpone action until all optimal resources are in place. Instead, they act using available resources, which helps shorten the gap between identifying an opportunity and transforming it into a concrete, value-creating activity (Fisher, 2012; Giones et al., 2020). In this regard, higher levels of bricolage are expected to increase an individual's tendency to carry out entrepreneurial activities.

H4: Entrepreneurial bricolage has a positive effect on entrepreneurial action.

Recent research shows that knowledge integration capability tends not to directly encourage entrepreneurial action, but rather works through improvisational mechanisms such as entrepreneurial bricolage (Zahra & George, 2002; Davidsson, 2018). KIC enables individuals to generate creative insights and new solutions based on cross-disciplinary interpretations, while bricolage translates these insights into concrete actions through the flexible, adaptive, and iterative use of resources (Fisher, 2012; Senyard et al., 2014). Thus, KIC provides the cognitive foundation for understanding and reconstructing opportunities, while bricolage becomes the behavioral mechanism that converts them into entrepreneurial activities. Recent literature supports the view that knowledge capabilities only generate entrepreneurial effectiveness when manifested through concrete improvisational actions (Clauss et al., 2021; Giones & Brem, 2020). Therefore, entrepreneurial bricolage is expected to be the main mediator between KIC and entrepreneurial action.

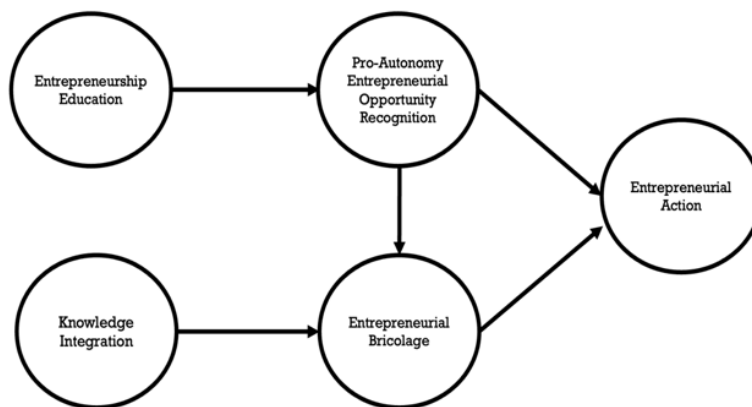
H6: Entrepreneurial bricolage mediates the relationship between knowledge integration capability and entrepreneurial action.

METHODS

Research design

The research model is designed to examine the mechanisms through which entrepreneurship education and knowledge integration influence entrepreneurial action. Specifically, the model proposes two indirect pathways: entrepreneurship education is expected to drive entrepreneurial action through pro-autonomy entrepreneurial opportunity recognition (PEOR). At the same time, knowledge integration is hypothesized to promote entrepreneurial action through entrepreneurial bricolage. This parallel mediation structure allows the study to identify how distinct cognitive and behavioral capabilities translate learning inputs into observable entrepreneurial action.

Figure 2: Research model



Measurement

All constructs in this study were measured using a five-point Likert questionnaire (1 = strongly disagree, 5 = strongly agree) developed from standardized instruments supported by established international theories. Entrepreneurship Education (10 items) was adapted from widely used scales of entrepreneurship education effectiveness (Fayolle & Gailly, 2015; Bae et al., 2014; Nabi et al., 2017) and includes measurements of business ideation ability, understanding of financing, market recognition, and readiness to run a venture. Knowledge Integration Capability (9 items) was developed based on indicators of cross-domain knowledge synthesis and transformation (Grant, 1996; Zahra & George, 2002; Nonaka, 1994) as well as the most recent operational measures from Huang and Jiao (2011).

Pro-Autonomy Entrepreneurial Opportunity Recognition (PEOR) (13 items) is a new construct formulated by integrating autonomous motivation (Deci & Ryan, 2017), agency-based opportunity evaluation and interpretation (McMullen & Shepherd, 2006; Dimov, 2007), and entrepreneurial alertness (Tang et al., 2012). This integration captures an individual's ability to recognize and prioritize opportunities that align with their personal values and knowledge base.

Entrepreneurial Bricolage (8 items) was measured using indicators from internationally validated bricolage scales (Baker & Nelson, 2005; Senyard et al., 2014), covering aspects such as making do, resource improvisation, and resource recombination. Entrepreneurial Action (4 items) was adapted from commonly used scales of entrepreneurial activity in nascent entrepreneurship research (McMullen & Shepherd, 2006; Frese & Gielnik, 2014; Gielnik et al., 2017), which measure concrete steps such as preparing business plans, conducting market validation, and acquiring resources.

All instruments underwent a translation–back translation process (Brislin, 1970), expert judgment, and a pilot test to ensure contextual fit. The CFA results showed that all constructs met the criteria for convergent validity ($AVE \geq 0.50$) and reliability ($CR \geq 0.70$) in accordance with the guidelines of Hair et al. (2019), indicating that the instruments are suitable for structural model testing.

Sample & data collection

This study uses a positivist research approach to examine how entrepreneurship education, PEOR, entrepreneurial bricolage, and entrepreneurial action relate to one another. The choice of this approach is appropriate. The study focuses on testing hypotheses objectively and relies on numerical patterns obtained from survey data, which aligns with the logic of a positivistic design (Creswell, 2014).

Data were collected using an online questionnaire was distributed using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The respondents were alumni of the Wirausaha Merdeka (WMK) program from the 2022 and 2023 cohorts. All of them had completed the full set of learning activities and project assignments in the program. Because the population was split into two cohorts with slightly different program structures, the sampling process used stratified random sampling. Each served as a separate stratum so that both groups were represented proportionally and the differences in their learning contexts could be taken into account.

The sample size was determined based on the recommendations of Hair et al. (2019), which requires a minimum of 10 respondents for each parameter estimated in SEM or a minimum of 150 respondents for complex structural models. From a total population of approximately 1,200 WMK graduates, the sample proportion in each stratum was determined based on the actual population composition of each cohort. A total of 75 respondents were from the 2022 cohort and 95 from the 2023 cohort, resulting in a total of 170 respondents, which met the sample adequacy criteria for SEM-AMOS.

The research instruments consisted of constructs that had been validated in previous studies, namely entrepreneurship education, knowledge integration capability, pro-autonomy entrepreneurial opportunity recognition, entrepreneurial bricolage, and entrepreneurial action. Before structural analysis was conducted, this study tested the reliability and validity of the constructs, including Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE), according to the guidelines of Hair et al.

(2019). The test results showed that all constructs met the reliability criteria ($CR \geq 0.70$; $\text{Alpha} \geq 0.70$) and convergent validity ($AVE \geq 0.50$), confirming the instrument's suitability.

The data were analyzed using Structural Equation Modeling (SEM) with AMOS software to test hypotheses, assess the model fit and evaluate the mediating relationships between variables.

RESULTS

Descriptive Statistics

Table 1 presents the demographic dan entrepreneurial profiles of 170 respondents who participated in this study. Participants came from WMK 2023 (55.88%), while 44.12% were graduates of WMK 2022. Most respondents reported that they having started a business after participating in the program (80%); however, this information is self-reported and has not been further verified through objective data such as business continuity, turnover, or other performance measures. Therefore, these figures should be interpreted with caution. Regarding business legality, 33.81% of respondents possess an NIB, 18.57% hold halal certification, and 14.76% have a PIRT permit. Additionally, 6.19% operate under a CV and 2.86% under a PT. Around 20% reported not having any formal legality. The majority of respondents run micro-scale businesses with 1–5 employees (81.18%). Overall, the respondent profile shows the characteristics of start-up entrepreneurs who are still in the early stages of business development.

Table 1: Respondent profile

Respondent Characteristics	Frequency (n=170)	Percentage
Year of Participation in WMK		
WMK 2022	75	44.12%
WMK 2023	95	55.88%
Business Establishment		
Establish before the Program	34	20.00%
Establish after the Program	136	80.00%
Business Formalization		
No formal license	42	20.00%
UD (Sole Proprietorship)	1	0.48%
CV (Limited Partnership)	13	6.19%
PT (Limited Liability Company)	6	2.86%
B POM (Food and Drug Authority Registration)	1	0.48%
Halal	39	18.57%
HAKI (Intellectual Property Rights)	3	1.43%
HACCP (Hazard Analysis and Critical Control Points)	3	1.43%
NIB (Business Identification Number)	71	33.81%

Respondent Characteristics	Frequency (n=170)	Percentage
PIRT (Home Industry Product Permit)	31	14.76%
Number of Employees		
No employees (0)	18	10.59%
1–5 employees	138	81.18%
6–10 employees	9	5.29%
11–15 employees	4	2.35%
More than 15 employees (>15)	1	0.59%

Note: Respondents could select more than one type of business formalization; therefore, percentages for this category are calculated based on total responses rather than total respondents.

Validity & reliability test

Validity and reliability tests were evaluated using standardized loading values, average variance extracted (AVE), and construct reliability (CR) as recommended by Hair et al. (2019). All indicators had loading values ≥ 0.70 , all constructs had AVE ≥ 0.50 , and CR ≥ 0.70 . Thus, all constructs were found to meet the criteria for convergent validity and adequate internal reliability.

Table 2: Convergent validity and construct reliability

Variable & Indicator	Std. Loading	Convergent Validity (AVE ≥ 0.50)	Construct Reliability (CR ≥ 0.70)
Entrepreneurship Education (EE)		0.714	0.961
EE1	0.990		
EE2	0.821		
EE3	0.832		
EE4	0.825		
EE5	0.827		
EE6	0.824		
EE7	0.826		
EE8	0.817		
EE9	0.835		
EE10	0.836		
Knowledge Integration Capability (KIC)		0.712	0.957
KIC1	0.990		
KIC2	0.813		
KIC3	0.813		
KIC4	0.829		
KIC5	0.825		
KIC6	0.817		
KIC7	0.828		
KIC8	0.831		
KIC9	0.832		
Pro-Autonomy Entrepreneurial Opportunity Recognition (PAEOR)		0.682	0.965
PAEOR1	0.991		

PAEOR2	0.825		
PAEOR3	0.798		
PAEOR4	0.803		
PAEOR5	0.795		
PAEOR6	0.815		
PAEOR7	0.814		
PAEOR8	0.816		
PAEOR9	0.805		
PAEOR10	0.804		
PAEOR11	0.808		
PAEOR12	0.823		
PAEOR13	0.817		
Entrepreneurial Bricolage (EB)		0.683	0.945
EB1	0.993		
EB2	0.784		
EB3	0.810		
EB4	0.806		
EB5	0.791		
EB6	0.794		
EB7	0.820		
EB8	0.792		
Entrepreneurial Action (EA)		0.759	0.926
EA1	0.987		
EA2	0.843		
EA3	0.819		
EA4	0.826		

Normality analysis

The normality test indicates that several indicators have skewness and kurtosis values with critical ratios (c.r.) exceeding ± 2.58 . This pattern is commonly found in Likert scale-based survey data due to its ordinal nature, which tends to produce non-normal distributions (Byrne, 2010; Rhemtulla et al., 2012). Hair et al. (2019) and Kline (2016) emphasize that univariate normality violations are not a serious problem in Maximum Likelihood (ML)-based SEM, especially when the sample size is adequate ($n > 150$) and factor loadings are high. Furthermore, the results of the multivariate normality test show a kurtosis value of 1.788, which is still within the tolerable limits for ML estimation. Thus, the model remains feasible for analysis using ML because this estimator has been proven to be robust against moderate normality deviations in Likert scale data and large sample sizes (West, Finch, & Curran, 1995; Kline, 2016).

Table 3: Assessment of univariate and multivariate normality

Variable	min	max	skew	c.r.	kurtosis	c.r.
EE10	1.000	5.000	-0.209	-1.669	-1.105	-4.419
EE9	1.000	5.000	-0.344	-2.749	-1.014	-4.057
EE8	1.000	5.000	-0.391	-3.130	-0.811	-3.243
EE7	1.000	5.000	-0.302	-2.417	-0.962	-3.849
EE6	1.000	5.000	-0.288	-2.303	-0.939	-3.757

EE5	1.000	5.000	-0.323	-2.584	-0.948	-3.794
EE4	1.000	5.000	-0.297	-2.379	-1.048	-4.192
EE3	1.000	5.000	-0.298	-2.381	-1.058	-4.231
EE2	1.000	5.000	-0.293	-2.342	-0.996	-3.984
EE1	1.000	5.000	-0.348	-2.785	-1.017	-4.068
KIC9	1.000	5.000	-0.324	-2.593	-0.993	-3.971
KIC8	1.000	5.000	-0.309	-2.469	-1.102	-4.407
KIC7	1.000	5.000	-0.319	-2.549	-1.024	-4.096
KIC6	1.000	5.000	-0.327	-2.616	-0.951	-3.805
KIC5	1.000	5.000	-0.247	-1.975	-1.016	-4.063
KIC4	1.000	5.000	-0.331	-2.648	-1.014	-4.057
KIC3	1.000	5.000	-0.300	-2.404	-0.883	-3.532
KIC2	1.000	5.000	-0.363	-2.903	-0.893	-3.571
KIC1	1.000	5.000	-0.356	-2.846	-0.970	-3.881
EB8	1.000	5.000	-0.289	-2.309	-0.937	-3.750
EB7	1.000	5.000	-0.398	-3.183	-0.836	-3.345
EB6	1.000	5.000	-0.364	-2.909	-0.795	-3.181
EB5	1.000	5.000	-0.383	-3.061	-0.903	-3.612
EB4	1.000	5.000	-0.273	-2.188	-0.998	-3.993
EB3	1.000	5.000	-0.283	-2.265	-0.817	-3.266
EB2	1.000	5.000	-0.433	-3.463	-0.650	-2.601
EB1	1.000	5.000	-0.368	-2.945	-0.876	-3.505
EB8	1.000	5.000	-0.289	-2.309	-0.937	-3.750
EB7	1.000	5.000	-0.398	-3.183	-0.836	-3.345
EB6	1.000	5.000	-0.364	-2.909	-0.795	-3.181
EB5	1.000	5.000	-0.383	-3.061	-0.903	-3.612
PAEOR13	1.000	5.000	-0.310	-2.483	-0.980	-3.919
PAEOR12	1.000	5.000	-0.318	-2.547	-0.985	-3.942
PAEOR11	1.000	5.000	-0.356	-2.850	-0.949	-3.797
PAEOR10	1.000	5.000	-0.358	-2.866	-0.939	-3.758
PAEOR9	1.000	5.000	-0.301	-2.409	-0.918	-3.673
PAEOR8	1.000	5.000	-0.373	-2.981	-0.908	-3.633
PAEOR7	1.000	5.000	-0.299	-2.396	-0.972	-3.889
PAEOR6	1.000	5.000	-0.367	-2.933	-0.849	-3.394
PAEOR5	1.000	5.000	-0.427	-3.412	-0.827	-3.307
PAEOR4	1.000	5.000	-0.380	-3.042	-0.796	-3.182
PAEOR3	1.000	5.000	-0.343	-2.741	-0.853	-3.413
PAEOR2	1.000	5.000	-0.333	-2.662	-0.939	-3.756
PAEOR1	1.000	5.000	-0.390	-3.119	-0.936	-3.743
EA4	1.000	5.000	-0.466	-3.731	-0.791	-3.162
EA3	1.000	5.000	-0.495	-3.960	-0.819	-3.274
EA2	1.000	5.000	-0.457	-3.657	-0.827	-3.309
EA1	1.000	5.000	-0.650	-5.200	-0.607	-2.427
Multivariate	—	—	14.191	1.788		

Goodness of fit

The goodness of fit test results indicate that the model has met most of the feasibility criteria. The χ^2/df value of 1.127, RMSEA of 0.036, and SRMR of 0.066 are in the excellent fit category, while model improvement indices such as CFI (0.979), TLI (0.978), and IFI (0.979) also exceed the recommended thresholds (Hair et al., 2019). The NFI (0.840), PGFI (0.728), and PNFI (0.795) values indicate adequate incremental and parsimony fit. However, GFI (0.804) and AGFI (0.783) are in the marginal category, which can occur

in models with a large number of indicators. On the other hand, a complex structural conditions that commonly lower GFI/AGFI because these indices are very sensitive to sample size and number of parameters (Kline, 2016). As noted by Kline (2016), GFI and AGFI tend to decline in complex models even when the underlying measurement structure is strong, so marginal values should be interpreted cautiously. This view is consistent with arguments by Hair et al. (2019) and Marsh, Hau, and Wen (2004), who emphasize that GFI-based indices are highly sensitive to model complexity and sample size, making them less reliable than incremental indices such as CFI or TLI. Importantly, no low factor loadings requiring model modification were found, so the model was retained without adding or removing indicators. Considering the overall fit indices, the model was generally deemed suitable for use in hypothesis testing.

Table 4: Goodness of fit indices

Index	Recommended Threshold	Observed Value	Interpretation
Absolute Fit Indices			
χ^2/df (CMIN/df)	1.00 – 5.00	1.127	Good fit
p-value	> 0.05	0.005	Significant but acceptable*
Goodness-of-Fit Index (GFI)	> 0.90	0.804	Marginal fit
Adjusted GFI (AGFI)	> 0.80	0.783	Acceptable
Root Mean Square Error of Approximation (RMSEA)	< 0.08	0.036	Excellent fit
Standardized Root Mean Square Residual (SRMR)	< 0.08	0.066	Good fit
Incremental Fit Indices			
Normed Fit Index (NFI)	> 0.80	0.840	Acceptable
Comparative Fit Index (CFI)	> 0.95	0.979	Excellent fit
Tucker–Lewis Index (TLI)	> 0.95	0.978	Excellent fit
Incremental Fit Index (IFI)	> 0.90	0.979	Excellent fit
Parsimony Fit Indices			
Parsimony Goodness-of-Fit Index (PGFI)	> 0.50	0.728	Good fit
Parsimony Normed Fit Index (PNFI)	> 0.50	0.795	Good fit

Structural equation modelling analysis

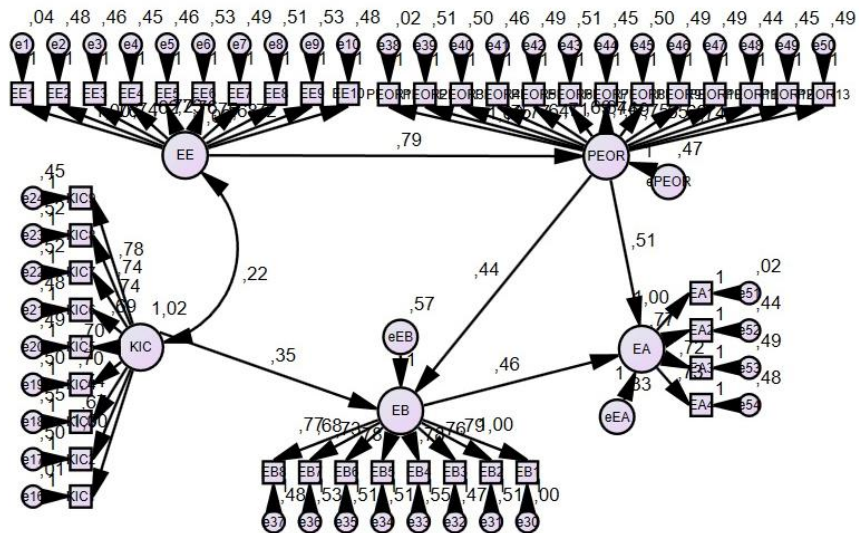
The goodness of fit test results show that the model has met the feasibility criteria. The χ^2/df value of 1.127, RMSEA of 0.036, and SRMR of 0.066 are within the acceptable limits. Model improvement indices such as CFI (0.979), TLI (0.978), and IFI (0.979) also exceed the recommended thresholds, while NFI (0.840) is in the acceptable category. In addition, PGFI (0.728) and PNFI (0.795) indicate an adequate level of parsimony. Overall, the model is categorized as fit and suitable for further analysis (Hair et al., 2019). These results indicate that the two mechanisms of PEOR (cognitive-psychological mechanism) and bricolage (behavioral-improvisational mechanism) both play an important role as bridges. They explain how entrepreneurship

education and knowledge integration are transformed into entrepreneurial action. These findings are consistent with the literature emphasizing the importance of autonomy-driven judgment and creative resource recombination as predictors of entrepreneurial behavior.

Table 5: Structural model results and hypothesis testing

	Dependent Variable		Independent Variable	β	S.E.	C.R. (t-value)	Decision
H1	PEOR	←	EE	,791	,056	14,170	Supported
H2	EB	←	KI	,355	,060	5,961	Supported
H3	EA	←	PEOR	,511	,052	9,750	Supported
H4	EA	←	EB	,463	,056	8,274	Supported

Figure 3: Structural equation modelling (SEM) results of the proposed theoretical model



The SEM results indicate that all paths in the model are significant and consistent with the theory. Entrepreneurship education has been proven to increase PEOR ($\beta = 0.791$), supporting the view that experience-based learning strengthens the process of recognizing autonomous opportunities (Souitaris et al., 2007; Nabi et al., 2017). Furthermore, PEOR has a positive effect on bricolage ($\beta = 0.511$), in line with the argument that personally meaningful opportunities encourage creativity in resource (Baker & Nelson, 2005; Senyard et al., 2014). Knowledge integration capability also enhances bricolage ($\beta = 0.355$), confirming that cross-domain knowledge combinations strengthen improvisational abilities in resource-constrained conditions (Grant, 1996; Zahra & George, 2002). At the outcome stage, both PEOR ($\beta = 0.446$) and bricolage ($\beta = 0.463$) positively influence entrepreneurial action, supporting literature that emphasizes opportunity recognition and resource

enactment as key triggers for action under uncertainty (McMullen & Shepherd, 2006; Davidsson, 2018). All results indicate that the mediation process is complementary and no direction of the relationship changes, so that the mechanisms in the model reflect stable cognitive and behavioral pathways.

Mediating Effect

Table 6: Mediation analysis results using the sobel test

Path	a	SE_a	b	SE_b	Z (sobel)	Decision
EE → PEOR → EA	0.791	0.056	0.511	0.052	8.067	Supported
KI → EB → EA	0.355	0.06	0.463	0.056	4.812	Supported

Mediation analysis using the Sobel test (Sobel, 1982) indicate that both mediation pathways in the model are significant. In the first pathway, the indirect effect of entrepreneurship education on entrepreneurial action through PEOR is significant ($Z = 8.067$, $p < 0.001$) with an indirect effect of 0.404. This value indicates that most of the influence of EE on EA runs through PEOR, confirming that autonomy-based opportunity recognition is the main psychological mechanism that drives the transition from learning to action (Deci & Ryan, 2000; McMullen & Shepherd, 2006).

In the second pathway, knowledge integration capability (KIC) indirectly influences entrepreneurial action (EA) through entrepreneurial bricolage (EB) ($Z = 4.812$, $p < 0.001$) with an indirect effect of 0.164. This effect is smaller than the first path, indicating that the role of bricolage is moderate but still important as a resource-based mechanism that enables entrepreneurial action (EA) under conditions of scarcity (Baker & Nelson, 2005). This comparison shows that the cognitive–psychological pathway (EE → PEOR → EA) is considerably stronger than the behavioral–resource pathway (KI → EB → EA), indicating that autonomy-driven opportunity internalization plays a more dominant role in mobilizing action. This pattern aligns with prior evidence that cognitive mechanisms such as personal agency, autonomous motivation, and opportunity meaningfulness exert a stronger influence on entrepreneurial action than resource recombination alone (Deci & Ryan, 2017; McMullen & Shepherd, 2006; Dimov, 2007). Likewise, several studies have noted that resource-based behaviors like bricolage typically generate moderate effects unless individuals have already internalized the opportunity cognitively (Senyard et al., 2014; Fisher, 2012), reinforcing the centrality of autonomous opportunity evaluation in triggering action.

DISCUSSION

Interpretation of key finding

The findings of this study indicate that entrepreneurship education not only increases students' sensitivity to opportunities, but also substantially strengthens their ability to recognize opportunities autonomously through PEOR. PEOR is different from traditional opportunity recognition that focuses on alertness to external market signals (Shane & Venkataraman, 2000; Baron, 2007). It functions as an internal mechanism that allows individuals to select and interpret opportunities based on personal values and the integration of cross-disciplinary knowledge. The strong and consistent effect of PEOR on entrepreneurial action indicates that individuals act when they perceive opportunities as self-endorsed and aligned with their entrepreneurial identity, supporting the view that action is driven by personally meaningful opportunities (McMullen & Shepherd, 2006; Van Gelderen, 2010). Thus, PEOR fills a conceptual gap left by conventional OR models by explaining how individuals determine which opportunities are worth executing, rather than merely identifying them.

In addition, entrepreneurial bricolage serves as a complementary mechanism that transforms knowledge integration capability into improvisational actions under resource constraints. This pattern aligns with prior literature indicating that bricolage is a creative process that enables entrepreneurs to act despite resource scarcity (Baker & Nelson, 2005; Senyard et al., 2014; Desa & Basu, 2013). However, its path strength remains lower than that of the PEOR→EA path, indicating that entrepreneurial action cannot be adequately explained by technical ability or knowledge mastery alone (Grant, 1996; Zahra & George, 2002; Eisenhardt & Martin, 2000). Instead, actions are more triggered by the process of internalizing opportunities that generate intrinsic commitment, perceived control, and persistence toward achieving goals (Deci & Ryan, 2017; McMullen & Shepherd, 2006; Van Gelderen, 2010). The dominant effect of PEOR on Entrepreneurial Action is also consistent with studies emphasizing that autonomous agency and personal meaningfulness are core determinants in mobilizing entrepreneurial behavior (Dimov, 2007; Carsrud & Brännback, 2011; Frese, 2021). Taken together, this pattern reinforces the argument that the intention–action gap emerges because of the absence of cognitive mechanisms that connect learning with action prioritization. The findings of this study position PEOR as the missing cognitive mechanism that has not been captured in either the SCT or RBT frameworks (Bandura, 1986; Barney, 1991). Accordingly, the main contribution of this study is to offer a new theoretical explanation of how entrepreneurship education is actually converted into real and sustained entrepreneurial action. The dominance of the PEOR effect on EA is also consistent with studies emphasizing that autonomous agency and personal meaningfulness are key determinants in the mobilization of entrepreneurial action (Dimov, 2007; Carsrud & Brännback, 2011; Frese, 2021). Overall, this pattern reinforces the theory that the intention–action gap arises due to a lack of cognitive mechanisms linking learning to action priorities; and the results of this study position PEOR as the missing cognitive mechanism that has not been identified in the SCT or RBT models (Bandura, 1986; Barney, 1991). Thus, the main contribution of this study is to provide a new theoretical explanation

of how entrepreneurship education is translated into real and sustainable entrepreneurial action.

The mediating role of pro-autonomy entrepreneurial opportunity recognition

The findings of this study suggest that PEOR is not simply another variant of opportunity recognition but a deeper cognitive mechanism that shapes whether recognized opportunities are actually carried forward into action. In contrast to the classical view, which positions alertness to market signals as the initial point of departure (Shane & Venkataraman, 2000; Baron, 2006), PEOR operates as a self-endorsed evaluative process. Individuals not only identify opportunities; they also affirm them as consistent with their personal values and identity orientations. The robust effect influence of entrepreneurship education on PEOR ($\beta = 0.791$) indicates that learning becomes effective only when participants internalize what they learn psychologically, rather than merely understanding the concept of opportunity at a cognitive level (Deci & Ryan, 2017; Morris et al., 2013). In this sense, PEOR acts as a gatekeeping mechanism, determining which opportunities are viewed as worthy of enactment into the action stage.

Furthermore, the significant influence of PEOR on entrepreneurial action ($\beta = 0.511$) shows that entrepreneurial action arises from personal meaningfulness and intrinsic commitment to the opportunity, rather than from external motivation or material exposure alone (Dimov, 2007; McMullen & Shepherd, 2006). Thus, PEOR helps resolve the intention–action gap by providing by providing a mechanism that converts learning into prioritized action. These findings confirm that PEOR is not only a mediator, but also the missing cognitive mechanism that explains how entrepreneurship education actually produces real and sustainable entrepreneurial action.

Theoretical contribution

This study makes an important theoretical contribution by demonstrating that opportunity recognition is not solely determined by alertness to external signals, as proposed in classical models. Instead, it is also shaped by an internal mechanism called Pro-Autonomy Entrepreneurial Opportunity Recognition (PEOR). The finding that PEOR significantly links entrepreneurial education to entrepreneurial action expands our understanding of psychological mediators in the entrepreneurial process, while challenging the assumption that increased knowledge or learning exposure automatically results in action. By integrating Social Cognitive Theory and Resource-Based Theory, this study provides evidence that entrepreneurial action arises from the interaction between autonomous cognitive processes (internalization of opportunities) and resource-based behavioral capabilities (bricolage). Accordingly, this research offers a new foundation for the development of entrepreneurship theory by positioning PEOR as a previously unidentified cognitive mechanism. It also opens new

avenues for investigating how agency and value-based judgments shape the transition from intention to action.

Practical implications

The findings of this study offer important practical implications for education providers and entrepreneurship policymakers. Since the PEOR→EA pathway has been proven to be more dominant than alternative pathways, education programs need to provide space for students to internalize opportunities autonomously, for example through value-based opportunity assessment, guided reflection, and independent exploration projects. On the other hand, the role of entrepreneurial bricolage in action shows the need for resource-constrained prototyping and field experiments so that students become accustomed to making decisions under limited conditions. For governments and program managers such as WMK, these findings emphasize the importance of mentoring that promotes autonomy and experimental practice in real environments. They also highlight opportunities to develop PEOR-based assessments as indicators of students' readiness to engage in entrepreneurial action. This approach enables more precise intervention design because it is based on psychological and behavioral aspects that have been proven to contribute directly to entrepreneurial action.

Limitations

This study has several important limitations that should be considered when interpreting the results. First, psychological variables such as PEOR and entrepreneurial bricolage were measured through self-reported instruments. These measures are vulnerable to perceptual biases, consistency motives, and common method bias. Therefore, interpretations related to action-oriented constructs should be made cautiously (Podsakoff et al., 2003). Second, the study employs a cross-sectional design. As the data were collected at a single point in time, the study could not observe the temporal unfolding of the intention–action transition. Prior research suggests that entrepreneurial action develops progressively and is influenced by dynamic experiences over time (Shepherd, Williams, & Patzelt, 2015; McMullen & Dimov, 2013), indicating that causal interpretations are not appropriate for this model. Additionally, the relatively high CR and AVE values observed across constructs likely reflect the unidimensionality of the scales and strong inter-item correlations, a pattern frequently reported in theoretically homogeneous psychological measures.

The context of the sample also imposes limitations. All respondents were drawn from a single entrepreneurship education program with a specific curriculum design. As a result, the findings may reflect characteristics unique to the WMK program and may not generalize to institutions that employ different pedagogical structures. Earlier studies highlight that curriculum design, mentor quality, and the intensity of field-based learning can meaningfully affect students' readiness for entrepreneurial action (Rae,

2006; Pittaway & Cope, 2007). In addition, although several respondents indicated that they had started a business, the study did not verify objective behavioral indicators such as revenue, business continuity, or progress in business model development. Without objective validation, discrepancies between perceived and actual entrepreneurial action may occur, as noted by Williams and Nadin (2012).

Finally, the broader Indonesian context must be acknowledged. As a developing country, Indonesia exhibits variation in access to capital, uneven entrepreneurial ecosystem quality, and gaps in business-related knowledge. These structural conditions can shape how individuals perceive opportunities and how effectively they are able to execute them (Amorós & Bosma, 2014; Autio & Rannikko, 2016). Consequently, the generalizability of the findings to countries with more mature entrepreneurial ecosystems remains limited.

Future research

Future research could address the limitations of self-reported data by incorporating objective behavioral indicators, such as business legality, operational continuity, customer counts, or revenue growth. These indicators would help validate whether PEOR and bricolage effectively translate into entrepreneurial action. The cross-sectional design used in this study also highlights the need for longitudinal approaches that can capture how PEOR and bricolage develop over time and how these dynamics gradually shape readiness to act and business performance. This study focused on participants of the WMK program, which follows a specific curriculum structure. Future research should examine the model in different institutional settings, including other universities, incubation programs, or non-student nascent entrepreneurs. Such studies would help determine whether the mediation mechanisms hold across diverse entrepreneurship education ecosystems. The broader Indonesian context as a developing country also opens opportunities for cross-country comparison, allowing researchers to test whether the strength of PEOR and bricolage varies in environments with stronger access to capital, more established infrastructure, or denser business networks.

Alternatively, given that the psychological variables were measured using Likert-type scales which are susceptible to bias, future research may benefit from integrating qualitative approaches, behavioral tracking, or field experiments to better examine the cognitive processes behind opportunity internalization and improvisational action. Adding variables such as entrepreneurial persistence, experimentation behavior, or the role of identity may further enrich theoretical understanding of how entrepreneurial action emerges in project-based learning contexts.

CONCLUSION

This study demonstrates that entrepreneurship education influences entrepreneurial action through a series of cognitive and behavioral mechanisms, particularly pro-autonomy entrepreneurial opportunity recognition (PEOR) and entrepreneurial bricolage. PEOR reflects the autonomous process through which students identify and endorse opportunities that align with their personal values and capability base. In contrast, bricolage represents the improvisational behavior that allows these opportunities to translate into concrete action under resource constraints. The findings also indicate that knowledge integration capability strengthens bricolage, increasing the likelihood that recognized opportunities will be executed. Taken together, the study underscores that entrepreneurial action emerges not from knowledge alone, but from the interplay between psychological readiness and resource-based improvisation, which translates learning experiences into meaningful entrepreneurial behavior.

REFERENCES

- Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1–2), 11–26. <https://doi.org/10.1002/sej.4>
- Amorós, J. E., & Bosma, N. (2014). *Global Entrepreneurship Monitor 2013 Global Report*. Global Entrepreneurship Research Association. <https://www.gemconsortium.org/report/49079>
- Autio, E., & Rannikko, H. (2016). Retaining winners: Can policy boost high-growth entrepreneurship? *Research Policy*, 45(1), 42–55. <https://doi.org/10.1016/j.respol.2015.06.002>
- Bae, T. J., Qian, S., Miao, C., & Fiet, J. O. (2014). The relationship between entrepreneurship education and entrepreneurial intentions: A meta-analytic review. *Entrepreneurship Theory and Practice*, 38(2), 217–254. <https://doi.org/10.1111/etap.12095>
- Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50(3), 329–366.
- Baluku, M. M., Munene, J. C., & Kibanja, G. M. (2020). Positive psychological attributes and entrepreneurial actions: Evidence from Uganda. *Frontiers in Psychology*, 11, 546745. <https://doi.org/10.3389/fpsyg.2020.546745>
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- Baron, R. A. (2006). Opportunity recognition as the detection of meaningful patterns. *Management Science*, 52(9), 1331–1342. <https://doi.org/10.1287/mnsc.1060.0538>
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3), 185–216. <https://doi.org/10.1177/135910457000100301>
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). Routledge.
- Carsrud, A., & Brännback, M. (2011). Entrepreneurial motivations. In A. Carsrud & M. Brännback (Eds.), *Handbook of research on entrepreneurship* (pp. 11–36). Edward Elgar.
- Clauss, T., Bouncken, R. B., & Laudien, S. M. (2021). Knowledge integration in entrepreneurship: Antecedents and performance effects. *Journal of Business Research*, 130, 902–912. <https://doi.org/10.1016/j.jbusres.2019.09.075>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

- Davidsson, P., Recker, J., & von Briel, F. (2018). Externally enabled bricolage in nascent entrepreneurship: The role of digital artifacts. *Strategic Entrepreneurship Journal*, 12(3), 369–396. <https://doi.org/10.1002/sej.1288>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Deci, E. L., & Ryan, R. M. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- De Carolis, D. M., & Saporito, P. (2006). Social capital, cognition, and entrepreneurial opportunities: A theoretical framework. *Entrepreneurship Theory and Practice*, 30(1), 41–56. <https://doi.org/10.1111/j.1540-6520.2006.00109.x>
- Desa, G., & Basu, S. (2013). Double-bottom-line venture creation and bricolage: Resource constraints and social entrepreneurship. *Journal of Business Venturing*, 28(6), 667–684. <https://doi.org/10.1016/j.jbusvent.2013.03.001>
- De Tienne, D. R., & Chandler, G. N. (2007). The role of gender in opportunity identification. *Entrepreneurship Theory and Practice*, 31(3), 365–386. <https://doi.org/10.1111/j.1540-6520.2007.00178.x>
- Dimov, D. (2007). Beyond the single-person, single-insight attribution of entrepreneurial opportunities. *Entrepreneurship Theory and Practice*, 31(5), 713–731. <https://doi.org/10.1111/j.1540-6520.2007.00196.x>
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10–11), 1105–1121. [https://doi.org/10.1002/1097-0266\(200010/11\)21:10/11](https://doi.org/10.1002/1097-0266(200010/11)21:10/11)
- Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of Small Business Management*, 53(1), 75–93. <https://doi.org/10.1111/jsbm.12065>
- Fisher, G. (2012). Effectuation, causation, and bricolage: A behavioral comparison. *Entrepreneurship Theory and Practice*, 36(5), 1019–1051. <https://doi.org/10.1111/j.1540-6520.2012.00537.x>
- Foo, M.-D. (2011). Emotions and entrepreneurial opportunity evaluation: How do positive and negative emotions influence opportunity evaluation? *Entrepreneurship Theory and Practice*, 35(2), 375–393. <https://doi.org/10.1111/j.1540-6520.2009.00357.x>
- Foss, N. J. (2011). Why microfoundations for resource-based theory are needed and what they may look like. *Journal of Management*, 37(5), 1413–1428. <https://doi.org/10.1177/0149206310390219>
- Frese, M. (2021). Action regulation theory and entrepreneurship research. *Foundations and Trends in Entrepreneurship*.
- Frese, M., & Gielnik, M. M. (2014). The psychology of entrepreneurship. *Annual Review of Organizational Psychology and Organizational Behavior*, 1, 413–438. <https://doi.org/10.1146/annurev-orgpsych-031413-091326>
- Frese, M., & Gielnik, M. M. (2023). The psychology of entrepreneurship: Action and process. *Annual Review of Organizational Psychology and Organizational Behavior*, 10, 137–164. <https://doi.org/10.1146/annurev-orgpsych-120920-055646>
- Gaglio, C. M., & Katz, J. A. (2001). *The psychological basis of opportunity identification: Entrepreneurial alertness*. *Small Business Economics*, 16(2), 95–111. <https://doi.org/10.1023/A:1011132102464>
- Gielnik, M. M., Bledow, R., & Stark, M. S. (2017). A dynamic account of entrepreneurship education’s impact on entrepreneurial behavior. *Academy of Management Learning & Education*, 16(4), 556–579. <https://doi.org/10.5465/amle.2015.0180>
- Gielnik, M. M., Uy, M. A., Funken, R., & Bischoff, K. (2017). Boosting action effectiveness: An experimental study of goals, plans, and feedback. *Journal of Applied Psychology*, 102(9), 1306–1321. <https://doi.org/10.1037/apl0000225>
- Giones, F., & Brem, A. (2020). Entrepreneurial ecosystems and digitalization: A literature review. *Technological Forecasting and Social Change*, 146, 119737. <https://doi.org/10.1016/j.techfore.2019.119737>

- Global Entrepreneurship Monitor. (2024). *GEM 2023/2024 Global Report*. Global Entrepreneurship Research Association. <https://www.gemconsortium.org/report/gem-2023-2024-global-report>
- Grant, R. M. (1996). *Prospering in dynamically-competitive environments: Organizational capability as knowledge integration*. *Organization Science*, 7(4), 375–387. <https://doi.org/10.1287/orsc.7.4.375>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Haynie, J. M., Shepherd, D. A., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*, 25(2), 217–229. <https://doi.org/10.1016/j.jbusvent.2008.10.001>
- Huang, J., & Jiao, H. (2011). Organizational knowledge integration and performance: The effects of learning culture and knowledge sharing. *Journal of Knowledge Management*, 15(6), 802–819. <https://doi.org/10.1108/13673271111174339>
- Kamar Dagang dan Industri Indonesia. (2023). *Laporan kegiatan KADIN Indonesia tahun 2023*. KADIN Indonesia. <https://kadin.id/wp-content/uploads/Buku-Laporan-2023-Bahasa-Indonesia.pdf>
- Kautonen, T., van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice*, 39(3), 655–674. <https://doi.org/10.1111/etap.12056>
- Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia. (2023). *Panduan Program Wirausaha Merdeka 2023*. Jakarta: Kemdikbudristek. <https://wmk.kampusmerdeka.kemdikbud.go.id>
- Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.
- Larso, D., & Saphiranti, D. (2016). The role of creative courses in entrepreneurship education: A case study in Indonesia. *International Journal of Business*, 21(3), 216–225.
- Locke, K., & Golden-Biddle, K. (1997). Constructing opportunities for contribution: Structuring intertextual coherence and “problematizing” in organizational studies. *Academy of Management Journal*, 40(5), 1023–1062. <https://doi.org/10.5465/256926>
- Marsh, H. W., Hau, K.-T., & Wen, Z. (2004). In search of golden rules: Comment on hypothesis-testing approaches to setting cutoff values for fit indexes and dangers in overgeneralizing Hu & Bentler’s (1999) findings. *Structural Equation Modeling: A Multidisciplinary Journal*, 11(3), 320–341. https://doi.org/10.1207/s15328007sem1103_2
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management Review*, 31(1), 132–152. <https://doi.org/10.5465/amr.2006.19379628>
- McMullen, J. S., & Dimov, D. (2013). Time and the entrepreneurial journey: The problems and promise of studying entrepreneurship as a process. *Journal of Management Studies*, 50(8), 1481–1512. <https://doi.org/10.1111/joms.12049>
- Mitchell, R. K., Smith, B., Seawright, K. W., & Morse, E. A. (2002). Cross-cultural cognitions and the venture creation decision. *Academy of Management Journal*, 45(5), 974–993. <https://doi.org/10.5465/3069321>
- Morris, M. H., Webb, J. W., Fu, J., & Singhal, S. (2013). A competency-based perspective on entrepreneurship education: Conceptual and empirical insights. *Journal of Small Business Management*, 51(3), 352–369. <https://doi.org/10.1111/jsbm.12020>
- Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, 16(2), 277–299. <https://doi.org/10.5465/amle.2015.0026>
- Neck, H., & Corbett, A. (2018). The scholarship of teaching and learning entrepreneurship. *Entrepreneurship Education and Pedagogy*, 1(1), 8–41. <https://doi.org/10.1177/2515127417737286>
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37. <https://doi.org/10.1287/orsc.5.1.14>

- Othman, N., Ghazali, E., & Sung, S. L. (2020). Entrepreneurship education: Revisiting the gap between theory and practice. *Education + Training*, 62(7/8), 847–863. <https://doi.org/10.1108/ET-05-2019-0097>
- Ployhart, R. E., & Moliterno, T. P. (2011). Emergence of the human capital resource: A multilevel model. *Academy of Management Review*, 36(1), 127–150. <https://doi.org/10.5465/amr.2009.0318>
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.87>
- Rae, D. (2006). Entrepreneurial learning: A conceptual framework for technology-based enterprise. *Technovation*, 26(3), 336–351. <https://doi.org/10.1016/j.technovation.2005.02.017>
- Reynolds, P., Bosma, N., Autio, E., Hunt, S., De Bono, N., Servais, I., & Chin, N. (2005). Global Entrepreneurship Monitor: Data collection design and implementation 1998–2003. *Small Business Economics*, 24(3), 205–231. <https://doi.org/10.1007/s11187-005-1980-1>
- Rhemtulla, M., Brosseau-Liard, P. É., & Savalei, V. (2012). When can categorical variables be treated as continuous? *Psychological Methods*, 17(3), 354–373. <https://doi.org/10.1037/a0029315>
- Rideout, E. C., & Gray, D. O. (2013). Does entrepreneurship education really work? *A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education*. *Journal of Small Business Management*, 51(3), 329–351. <https://doi.org/10.1111/jsbm.12021>
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.
- Sarasvathy, S. D. (2001). Causation and effectuation. *Academy of Management Review*, 26(2), 243–263. <https://doi.org/10.5465/amr.2001.4378020>
- Senyard, J., Baker, T., Davidsson, P., & Steffens, P. (2014). Bricolage as a path to innovativeness for resource-scarce new firms. *Journal of Product Innovation Management*, 31(2), 211–230. <https://doi.org/10.1111/jpim.12090>
- Schlichte, F., & Junge, F. (2024). The concept of entrepreneurial opportunities: A review and extension. *Management Review Quarterly*. <https://doi.org/10.1007/s11301-024-00466-5>
- Schumpeter, J. A. (1942). *Capitalism, socialism and democracy*. Harper & Brothers.
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226. <https://doi.org/10.5465/amr.2000.2791611>
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217–226. <https://doi.org/10.5465/amr.2000.2791611>
- Shepherd, D. A. (2015). Party On! Cognition, emotion, and behavior in entrepreneurship. *Journal of Business Venturing*, 30(4), 489–507. <https://doi.org/10.1016/j.jbusvent.2014.09.002>
- Shepherd, D. A., Williams, T. A., & Patzelt, H. (2015). Thinking about entrepreneurial decision making: The interplay of context and cognition. *Academy of Management Review*, 40(1), 1–25. <https://doi.org/10.5465/amr.2013.0423>
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290–312). Jossey-Bass.
- Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention? A longitudinal study. *Journal of Business Venturing*, 22(4), 566–591. <https://doi.org/10.1016/j.jbusvent.2006.05.002>
- Tang, J., Kacmar, K. M., & Busenitz, L. (2012). Entrepreneurial alertness in opportunity identification. *Journal of Business Venturing*, 27(1), 77–94. <https://doi.org/10.1016/j.jbusvent.2010.07.001>
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7)

- Torraco, R. J. (2016). Writing integrative literature reviews: Using the past and present to explore the future. *Human Resource Development Review*, 15(4), 404–428. <https://doi.org/10.1177/1534484316671606>
- Tsou, E., Christiansen, J. K., & Verheul, I. (2023). The relationship between entrepreneurial intention and entrepreneurial behavior. *Journal of Small Business & Entrepreneurship*. <https://doi.org/10.1080/08276331.2023.2232140>
- Utami, C. W. (2021). Entrepreneurship education in Indonesian universities: Challenges in practical implementation. *Journal of Asian Finance, Economics and Business*, 8(4), 585–594. <https://doi.org/10.13106/jafeb.2021.vol8.no4.0585>
- Van Gelderen, M. (2010). Autonomy as the guiding aim of entrepreneurship education. *Education + Training*, 52(8/9), 710–721. <https://doi.org/10.1108/00400911011089006>
- Walter, S. G., & Block, J. H. (2016). Outcomes of entrepreneurship education: An institutional perspective. *Journal of Business Venturing*, 31(2), 216–233. <https://doi.org/10.1016/j.jbusvent.2015.10.003>
- Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180. <https://doi.org/10.1002/smj.4250050207>
- West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with nonnormal variables. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 56–75). SAGE Publications.
- Whetten, D. A. (1989). What constitutes a theoretical contribution? *Academy of Management Review*, 14(4), 490–495. <https://doi.org/10.5465/amr.1989.4308371>
- Williams, C. C., & Nadin, S. (2012). Entrepreneurship in the informal economy: Commercial or social entrepreneurs? *International Entrepreneurship and Management Journal*, 8(3), 309–324. <https://doi.org/10.1007/s11365-011-0169-x>
- Wood, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of Management Review*, 14(3), 361–384. <https://doi.org/10.5465/amr.1989.4279067>
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185–203. <https://doi.org/10.2307/4134351>