Developing A Training Curriculum with Social Listening and Active Learning for Mid-Career Workers' Entrepreneurial Skills

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Abstract

This study aimed to develop, implement, and evaluate a training curriculum that integrates social listening tools with active learning approaches to enhance the entrepreneurial skills of mid-career workers within the context of continuing and distance education. Employing a research and development (R&D) framework, the study was conducted in four phases. First, a needs assessment with 286 mid-career workers and 18 key informants identified entrepreneurial challenges, expectations, and learning preferences. Second, curriculum design was informed by a systematic literature review of international databases (Scopus, ERIC, and Project Muse) and validated by experts to ensure academic rigor and practical relevance. Third, pilot implementation with three participant groups (n = 9, 15, and 30) enabled iterative refinement. Finally, a summative evaluation with 30 participants tested curriculum effectiveness and reliability. Data collection tools included surveys, semi-structured interviews, achievement tests, curriculum evaluation forms, and satisfaction scales. Analyses employed descriptive statistics, dependent sample t-tests, E1/E2 efficiency indices, KR-20, and Cronbach's alpha. Results showed statistically significant improvements ($p < .001$) in entrepreneurial knowledge, skills, and attitudes, with high efficiency and satisfaction ($M = 4.63$). By integrating digital technologies with active learning, this study contributes to distance education literature by providing a validated curriculum model that supports mid-career workers' lifelong learning and sustainable workforce development.

Keywords: social listening, active learning, entrepreneurial skills, curriculum development, mid-career workers

1. Introduction

The rapid advancement of digital technologies and the growing volatility of global markets have fundamentally reshaped the competencies required across industries. Mid-career workers aged 35 to 59 now face a pivotal stage in their professional trajectories, as they strive to keep pace with technological change while maintaining long-term career stability. This transitional period, often described as middlescence, requires individuals to balance employment continuity, personal growth, and the pursuit of new entrepreneurial directions (Morison et al., 2006). In this context, entrepreneurial capabilities have become increasingly important. The expansion of the digital economy also requires workers interpret emerging opportunities and respond to market shifts using data-driven insights rather than traditional intuition (Naumann, 2017; Shane & Venkataraman, 2000). For many mid-career adults, cultivating these skills is a critical pathway for adapting to evolving professional environments and securing future livelihood opportunities.

Entrepreneurial skills extend beyond business creation and management to encompass creativity, problem-solving, opportunity recognition, adaptability, and resilience (Śledzik, 2013). For mid-career workers, these skills support not only the launch of new ventures but also the ability to reposition themselves within dynamic labor markets. Training interventions aimed at entrepreneurial skill development, however, often remain skewed toward younger populations, especially university students and early-career entrepreneurs (Rodrigues et al., 2023). This imbalance highlights the urgent need for structured, research-informed curricula tailored to the characteristics, experiences, and learning preferences of mid-career learners.

Existing entrepreneurial training models often rely on simulated case studies, static datasets, or generalized business scenarios that do not reflect the dynamics of digital consumer behavior (Morris et al., 2013). Although active learning approaches are increasingly used, many existing programs still lack mechanisms for engaging with real-time market signals or interpreting digital data as part of the learning process (Rae, 2009). Social listening practices are typically

applied in marketing analytics rather than used as a pedagogical strategy for building entrepreneurial competence (He et al., 2013). Consequently, learners, particularly mid-career workers, have limited opportunities to work with authentic consumer conversations or translate digital insights into opportunity recognition and problem-solving.

The curriculum developed in this study addresses these limitations by systematically integrating social listening tools with active learning activities. The innovation lies in combining real-time digital data with structured analytical tasks that require learners to examine consumer sentiment, identify emerging needs, and generate entrepreneurial ideas based on actual market signals (Ghezzi & Cavallo, 2020). Unlike existing models that treat digital analytics as supplementary skills, this curriculum positions digital insight generation as a core element of the learning sequence. This design contributes a novel pedagogical framework that demonstrates how social listening can function as a central mechanism for entrepreneurial learning and not merely as a marketing technique (He et al., 2013).

Social listening is essential for entrepreneurial learning because opportunity recognition increasingly depends on the ability to interpret digital signals in rapidly changing markets (Ceptureanu et al., 2020). For mid-career workers, who often transition into entrepreneurial roles without extensive experience in digital analytics, the ability to extract insights from online conversations provides a practical and immediately relevant foundation for decision-making. Embedding social listening into the learning process helps learners identify real customer pain points, validate assumptions with actual data, and develop more informed and responsive business ideas (York, 2019). This makes social listening a pedagogically necessary component for building data-driven entrepreneurial competence in the digital economy.

The intersection of active learning and social listening presents an innovative pathway for entrepreneurship education. Active learning offers pedagogical scaffolding, while social listening provides the technological and market-driven data inputs necessary for authentic learning experiences. Embedding social listening within an active learning curriculum allows learners to engage with real-time data, analyze consumer insights, and collaboratively develop entrepreneurial responses. This integration not only enhances knowledge acquisition but also strengthens practical skills and entrepreneurial attitudes (Silberman & Biech, 2015).

Nevertheless, a critical gap persists in literature and practice: few curriculum models systematically integrate social listening tools with active learning approaches to develop entrepreneurial skills among mid-career workers. Prior research often examines these elements separately, either by emphasizing pedagogical innovation without technological integration or by focusing narrowly on digital tools without considering their instructional alignment (Cantoia et al., 2024; Chen et al., 2019). Moreover, the majority of entrepreneurship education studies concentrate on university settings, leaving the specific needs of mid-career learners underexplored (Brown et al., 2012).

This gap is particularly pressing given that mid-career workers play a central role in sustaining national competitiveness, yet face heightened risks of redundancy without access to targeted, effective lifelong learning interventions (Setiya, 2021). Responding to this need, the present study employs a research and development (R&D) methodology to design, implement, and evaluate a training curriculum that integrates social listening tools with active learning approaches.

Grounded in both entrepreneurship and adult learning literature, the study systematically addresses the skill development needs of mid-career workers through four phases: needs assessment, curriculum design, pilot implementation, and summative evaluation. By embedding digital technologies within experiential pedagogies, the curriculum aims to enhance entrepreneurial knowledge, skills, and attitudes, enabling participants to navigate career transitions and seize new business opportunities (Ghezzi & Cavallo, 2020).

This research contributes to the fields of entrepreneurship education and adult learning by presenting a validated curriculum model that integrates social listening tools with active learning to enhance the entrepreneurial skills of mid-career workers. The study addresses a critical gap in curriculum design for this demographic, demonstrating how digital technologies can be pedagogically aligned with experiential approaches to meet the specific needs of adult learners (Merriam & Bierema, 2013). Furthermore, the curriculum provides a scalable and adaptable framework that can be implemented across diverse delivery modes, including online, blended, and distance learning, thereby reinforcing its significance for lifelong education and professional development in the digital economy (Bower, 2017).

Although prior studies have explored active learning strategies and the use of digital tools in entrepreneurship education, existing research tends to treat these elements as separate areas of innovation. Active learning studies rarely incorporate real-time consumer data or technology-mediated insights, which limits their relevance for entrepreneurial decision making (Morris et al., 2013). Research on social listening focuses mainly on technical analysis of online data and does not address how these tools can be embedded within instructional design to support deeper learning (Choy & Schlagwein, 2016). Existing curriculum models therefore lack a coherent integration of pedagogical processes and digital market intelligence. This limitation is particularly evident for mid-career workers, whose learning needs differ from those of university students, yet most published curricula are designed for younger learners and do not consider the constraints and professional experiences of adult workers (Brown, 2015).

The present study addresses these gaps by developing and validating a curriculum that integrates social listening with active learning in a systematic and pedagogically aligned manner. The integration enables learners to work with authentic market signals, apply analytical reasoning, and translate insights into entrepreneurial actions within structured learning activities (Allil, 2024). This approach advances existing models by combining experiential pedagogy with real-time digital data and by tailoring the curriculum to the characteristics of mid-career learners in online and distance education settings. The study therefore provides a novel contribution to entrepreneurship education, both by introducing a technology-enhanced curriculum framework and by extending the literature to an underserved learner population (Rae, 2009; Renko et al., 2012).

2. Literature Review

2.1 Context and Challenges of Mid-Career Workers

The accelerating pace of digital transformation, demographic change, and economic uncertainty has significantly impacted mid-career workers, typically aged between 35 and 59, who are now navigating complex transitions in both employment and identity. Once regarded as the stable backbone of the workforce, many in this group face growing risks of skill obsolescence, job insecurity, and limited upward mobility (Anderson et al., 2021; Jansen & Zumsteg, 2020), particularly in economies such as Thailand where traditional employment structures are being reshaped by automation and digital disruption (Laura & Choi, 2022).

Although various training programs have been introduced to reskill and upskill this demographic, most are not sufficiently tailored to their unique life stage, learning preferences, and entrepreneurial aspirations. Existing programs tend to rely on uniform instructional models, often overlooking the cognitive, emotional, and motivational shifts that define adult learners in midlife (Brown, 2015; Merriam & Bierema, 2013). As a result, many mid-career workers struggle to translate digital skill acquisition into practical entrepreneurial outcomes, particularly in increasingly competitive and data-driven markets.

There remains a gap in both policy and practice concerning how to effectively support mid-career transitions through learning. Literature often treats lifelong learning as a generalized process, without adequate consideration of the structural constraints, psychological readiness, and socio-economic responsibilities of adult learners. There is therefore a growing demand for more responsive and integrated training frameworks, ones that bridge digital competencies with entrepreneurial thinking, contextualized learning experiences, and sustainable self-employment pathways. Addressing these challenges is essential to enabling mid-career workers to thrive in an increasingly knowledge-based and innovation-driven economy.

2.2 Active Learning for Entrepreneurial Upskilling

Active learning has emerged as a powerful pedagogical paradigm for enhancing entrepreneurial competencies, particularly in adult and professional education contexts. Unlike passive, lecture-based instruction, active learning engages learners through real-world problem solving, collaboration, reflection, and iterative feedback. These methods are especially relevant to mid-career learners navigating complex market environments (Kong et al., 2021; Prince, 2004). Research indicates that adult learners benefit significantly from experiential and contextually rich learning strategies that mirror the dynamic nature of entrepreneurial activity.

Research indicates that adult learners benefit significantly from experiential, context-rich learning strategies that mirror the dynamic nature of entrepreneurial activity. These methods include project-based learning, case studies, role-playing, simulations, and design thinking, all of which encourage critical decision-making, adaptive thinking, and the development of practical skills transferable to entrepreneurial settings (Cantoia et al., 2024; Darban, 2022). Furthermore, active learning helps to cultivate autonomy, intrinsic motivation, and personal relevance—key factors in adult learning theory (Merriam & Bierema, 2013; Ryan & Deci, 2016).

For mid-career professionals, active learning is not just a methodology but a mechanism for reimagining their professional identities and skillsets. When applied within entrepreneurship training, it offers a platform to explore new business models, test market hypotheses, and learn from failure in a low-risk environment. Yet, despite its benefits, many training programs continue to underutilize active learning due to resource constraints, lack of instructional expertise, or rigid curricular structures (Jeyakumar et al., 2024; Torralba & Doo, 2020).

To fully harness its potential, active learning in entrepreneurship education must be deliberately designed to align with adult learners' lived experiences, time constraints, and cognitive engagement levels. This calls for instructional strategies that are modular, flexible, and supported by digital tools that facilitate asynchronous collaboration and self-paced exploration. Such an approach not only enhances skill acquisition but also supports the self-directed learning capacities required for sustained entrepreneurial success (Wittayakom et al., 2024).

2.3 Curriculum Design for Adult Learners in the Digital Era

Designing curricula for adult learners, especially mid-career professionals, requires a departure from traditional pedagogical frameworks toward more agile, responsive, and technology-enhanced models. Unlike younger learners, adults bring with them a wealth of professional experience, self-directed learning preferences, and specific performance goals—factors that necessitate a curriculum architecture rooted in relevance, flexibility, and immediate applicability (Merriam & Bierema, 2013).

In the context of entrepreneurship training, curriculum design must strike a balance between conceptual knowledge and experiential application. This involves the integration of modular content, case-based activities, and reflective assessments that enable learners to transfer insights into real-world business contexts. The Dick and Carey model (1996) provides a structured approach to systematic instructional design, yet for adult digital learners, the model must be adapted to include learner autonomy, digital interactivity, and scaffolding across asynchronous environments (Dick, 1996).

Digital learning environments, especially those incorporating active learning elements, offer powerful avenues to overcome the logistical constraints faced by mid-career learners. Online modules, breakout rooms, virtual simulations, and digital portfolios allow for personalization and scalability, enabling learners to engage in situated practice and receive iterative feedback (Almendingen et al., 2022; Fang et al., 2023). However, poor design or a lack of pedagogical alignment in digital tools can undermine learner engagement and compromise instructional outcomes.

Effective curricula for digital adult learners should also embed socio-emotional dimensions, such as peer interaction, mentorship, and collaborative problem solving, to mitigate the isolation often reported in online education (James et al., 2022). Furthermore, assessment strategies must evolve from mere knowledge testing toward evaluating entrepreneurial thinking, adaptability, and strategic execution.

Ultimately, curriculum development for adult learners in the digital age demands a learner-centric, purpose-driven approach—one that integrates real-time data, personalized learning pathways, and continuous feedback to foster both competence and confidence in entrepreneurial practice.

2.4 Leveraging Social Listening for Business Insights

In an era of data-driven decision-making, social listening has emerged as a vital tool for entrepreneurs to gain timely and contextually rich insights into consumer behavior, market sentiment, and emerging trends. Unlike traditional market research, which often relies on retrospective data, social listening enables real-time monitoring of online conversations across platforms, offering a dynamic view into the voice of the customer (Kılıçoğlu & Yıldırım, 2023).

For mid-career entrepreneurs navigating increasingly volatile markets, the ability to interpret and act on such insights is a crucial competency. Social listening not only reveals surface-level trends but also uncovers latent needs, emotional drivers, and cultural nuances that influence consumer decisions. Rodrigues et al. (2023) underscore that entrepreneurial intention is shaped by both internal and external stimuli, which makes tools that decode market signals especially valuable in cultivating market-responsive business strategies.

Moreover, the integration of social listening into training curricula addresses a critical gap in traditional entrepreneurship education, which often fails to emphasize real-time responsiveness and digital fluency. When paired with active learning approaches, social listening exercises can foster analytical thinking, creativity, and adaptability, all of which are essential for modern entrepreneurial success (Renko et al., 2012).

However, effective use of social listening tools requires more than technical proficiency. It demands interpretive agility, including the capacity to filter noise, contextualize insights, and translate findings into actionable strategies. Without guided training, learners may misinterpret data or overlook valuable signals. Therefore, embedding structured frameworks and reflective practice into social listening modules is essential to ensure learners develop critical data literacy alongside an entrepreneurial mindset.

Additionally, the rise of AI-powered analytics enhances the capacity of social listening platforms to provide predictive insights. Yet, it also raises questions about algorithmic bias, data ethics, and overreliance on automation. These issues must be actively addressed in the curriculum to foster not just competent but also responsible use of digital tools (Prachumrasee et al., 2024).

By positioning social listening as both a technical and strategic skill, training programs can equip adult learners with the real-time market intelligence needed to innovate, pivot, and thrive in complex business landscapes.

2.5 Entrepreneurial Competencies for Modern Workers

Entrepreneurship in the digital age requires a multifaceted set of competencies that extend far beyond traditional notions of business acumen. For mid-career individuals transitioning into self-employment or entrepreneurial ventures, the

development of cognitive, behavioral, and affective competencies is essential to succeed in uncertain and rapidly changing markets (Brown, 2015; Manolova et al., 2008).

Central to these competencies are opportunity recognition, risk management, strategic thinking, digital literacy, and adaptive leadership. These dimensions are often shaped by prior work experience, personal motivation, and social context, which are particularly influential among mid-career workers who may face both enabling and constraining forces in pursuing entrepreneurial paths (Rodrigues et al., 2023; Román-Calderón et al., 2023). Self-determination theory (Deci & Ryan, 2008) further emphasizes the role of intrinsic motivation, autonomy, and relatedness in sustaining entrepreneurial intention, an important consideration for adult learners with complex life roles.

Critically, mid-career entrepreneurs often need to unlearn corporate routines and adopt more agile, innovative mindsets. This requires not only new knowledge, but a transformation in identity, shifting from organizational employees to autonomous decision-makers. Learning experiences must therefore foster entrepreneurial attitudes and mindset change, not just skill acquisition (Merriam & Bierema, 2013).

Moreover, emotional resilience, self-efficacy, and social intelligence have been identified as key psychological enablers for navigating entrepreneurial uncertainty. Yet such competencies are rarely developed through conventional training formats. Active learning strategies, such as simulations, case-based analysis, and experiential reflection, are far more effective in nurturing these deeply embedded capacities (Kong et al., 2021; Prince, 2004).

In the context of digital business environments, technical competencies such as data interpretation, digital marketing, and the strategic use of platforms like social listening tools also gain prominence. However, these must be embedded within broader entrepreneurial frameworks that emphasize purpose-driven action, ethical decision-making, and societal value creation.

As the boundaries between employment and entrepreneurship continue to blur, especially in the context of the gig economy and knowledge-based work, entrepreneurial competencies are no longer optional; they are core capabilities for modern workers navigating uncertain futures.

2.6 Toward an Integrated Curriculum Model

The complexity of modern entrepreneurial challenges demands a curriculum model that integrates technological fluency, experiential learning, and personal transformation. Existing research highlights that disjointed or overly theoretical curricula often fail to engage adult learners or produce transferable outcomes (Cantoia et al., 2024; Merriam & Bierema, 2013). In contrast, integrated models that combine active learning with digital tools have shown promise in fostering deeper engagement, motivation, and applied skill development (Fang et al., 2023; Wittayakom et al., 2024).

Social listening tools, when paired with active learning strategies, offer a powerful combination for equipping mid-career workers with entrepreneurial insight and adaptability. These tools allow learners to engage directly with real-time market sentiment and consumer behavior, translating abstract data into actionable business opportunities. The integration of such technologies into curricula aligns with the growing emphasis on data-informed decision-making and digital innovation in entrepreneurship education (Adiego & Martín-Cruz, 2021).

Curriculum development frameworks such as the Dick and Carey model (1996) provide a systematic approach to designing instruction that is both learner-centered and outcome-driven. When applied in digital or hybrid learning environments, this approach ensures alignment between objectives, assessments, and instructional strategies, which is critical for adult learners with diverse needs and prior experience (Dick, 1996).

Furthermore, the evaluation of curriculum effectiveness must move beyond satisfaction surveys to include multidimensional measures such as E1/E2 efficiency scores, cognitive gains, attitudinal shifts, and long-term behavioral outcomes (Kirkpatrick & Kirkpatrick, 2016). The use of formative and summative assessments, along with learner self-reflection and peer feedback, can support ongoing curriculum refinement and personalization.

An integrated curriculum for entrepreneurial upskilling should not only transfer knowledge but also enable learners to reconstruct their professional identities. It must provide space for experimentation, failure, and feedback, elements that are essential to real-world entrepreneurial practice. Such a curriculum should also address systemic barriers faced by mid-career workers, such as technological anxiety, opportunity cost, and access to mentorship (Almendingen et al., 2022; Renko et al., 2012).

Ultimately, the goal is to move from modular training toward transformative learning ecosystems that are scalable, context-sensitive, and impact-driven. This vision calls for collaboration among educators, policymakers, technologists, and industry leaders to co-design future-ready curricula that bridge knowledge with action and ambition with capability.

2.7 Objectives of the Research

The purpose of this research was to design, implement, and evaluate a training curriculum that integrates social listening

tools with active learning approaches to enhance the entrepreneurial skills of mid-career workers. Guided by a research and development (R&D) framework, the study was structured into four interconnected objectives:

- To identify problems, expectations, and learning experiences related to entrepreneurship among mid-career workers. This objective focused on conducting a comprehensive needs assessment to determine the specific challenges and requirements of the target group in relation to entrepreneurial competence and digital skill development.

- To develop and design a training curriculum that integrates social listening tools with active learning. The curriculum was designed based on insights from the needs assessment, a systematic literature review, and expert consultation to ensure both theoretical rigor and practical applicability.

- To implement the pilot version of the curriculum with mid-career workers. The pilot phase involved iterative testing with small groups to refine the curriculum content, delivery methods, and learning activities, ensuring alignment with learners needs and adult learning principles.

- To evaluate the effectiveness of the curriculum in enhancing entrepreneurial knowledge, skills, and attitudes of mid-career workers. This objective emphasized the assessment of curriculum efficiency, learner achievement, self-assessment, and satisfaction to validate the curriculum model and establish its potential for wider application.
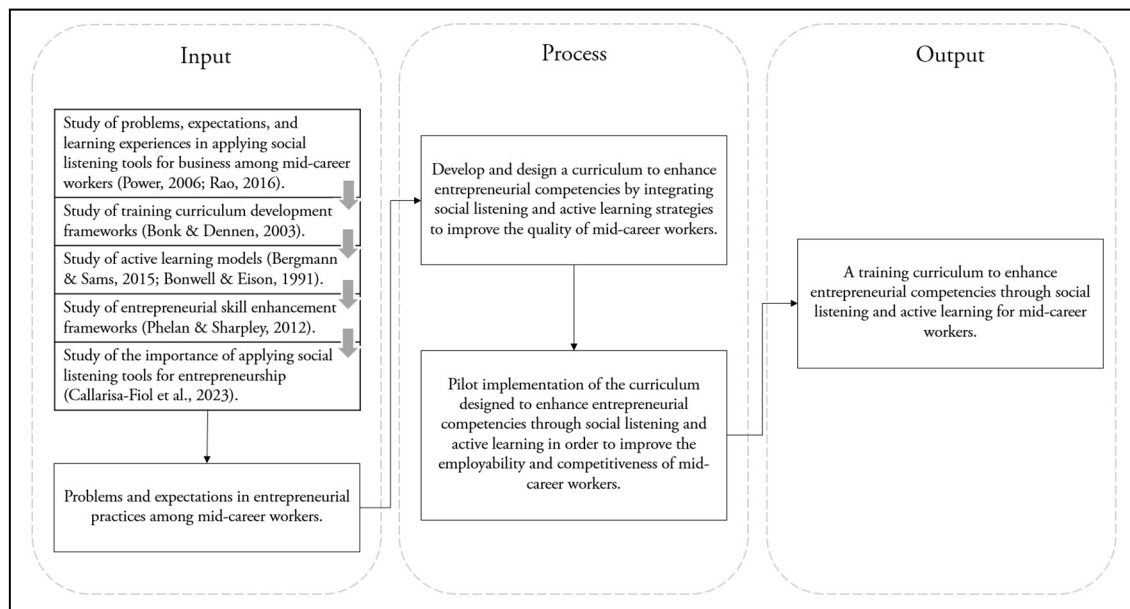
Figure 1. Research Framework

3. Method

This study adopted a research and development (R&D) design consisting of four phases: needs assessment (R1), curriculum development (D1), pilot implementation (R2), and evaluation (D2). A mixed-methods approach was employed across phases, combining quantitative and qualitative data for triangulation and enhance depth of interpretation. Sampling strategies varied by phase, including multi-stage random sampling, purposive expert selection, and iterative recruitment of participants for pilot testing.

The training curriculum consisted of six modules with a total instructional duration of 18 hours delivered over three consecutive days. All sessions were conducted synchronously through Zoom, which served as the primary platform for live instruction, demonstrations and interactive activities. Breakout rooms were used regularly for small-group problem-solving tasks, and screen sharing supported step-by-step demonstrations of social listening tools. Participants also conducted group presentations through Zoom as part of the applied learning tasks. Supplementary materials, including worksheets, readings and sample datasets, were distributed through Microsoft OneDrive to allow learners to access instructional resources asynchronously.

Active learning tasks were embedded throughout the modules. Learners practiced analyzing real-time social listening dashboards, identifying recurring consumer pain points from online conversations, interpreting keyword trends and developing opportunity insights based on digital information. Padlet was used as a collaborative workspace where participants synthesized data, generated ideas and constructed visual maps of emerging market signals. Short activities

were supported by interactive tools such as Kahoot, which was used periodically for formative checks of conceptual understanding and for maintaining learner engagement. Small-group exercises in Zoom breakout rooms required participants to combine digital evidence with entrepreneurial reasoning and decision-making.

Learning outcomes were aligned with instructional activities and assessment tasks. Knowledge-based outcomes related to entrepreneurial concepts and digital insight interpretation were assessed through Microsoft Forms, which delivered both pretests and posttests. Skill-based outcomes, including the synthesis of consumer insights and the development of opportunity ideas, were evaluated through practice exercises, Padlet-based analyses and group presentations. Reflective questions and short written responses were also collected through Microsoft Forms to assess learners' ability to link digital evidence with entrepreneurial reasoning. This alignment ensured that assessments measured the competencies targeted by each module and strengthened the integration of social listening with active learning.

3.1 Phase 1: Needs Assessment (R1)

3.1.1 Participants

A multi-stage random sampling strategy was applied to select 286 mid-career workers (ages 35–59) who had previously joined digital marketing training programs nationwide. In addition, 18 purposively selected key informants, including entrepreneurs, educators, and policymakers, were interviewed to ensure both breadth and depth of perspectives.

The final sample consisted of 286 mid-career workers aged 35 to 59 years, with a mean age of 44.7 years. Female participants accounted for 61.2 percent of the sample and male participants accounted for 38.8 percent. Participants represented diverse occupational sectors, including retail (27 percent), service industries (24 percent), education (13 percent), administrative work (11 percent), healthcare (9 percent), and other sectors (16 percent). A majority of the participants, representing 72 percent, reported prior experience in at least one digital marketing training program. This profile reflects a heterogeneous group of adult learners with varied professional backgrounds and baseline digital competencies, which aligns with the objectives of the curriculum.

Participants were recruited through announcements distributed to previous cohorts of national digital marketing programs and through partnerships with community entrepreneurship centers. Participation was voluntary and no financial incentives were offered. All individuals who completed the program received a certificate of completion. Eligibility criteria required participants to be between 35 and 59 years of age and to possess basic digital literacy skills. Individuals outside this age range or without prior exposure to digital learning environments were excluded to maintain alignment with the target population of mid-career workers engaged in digital skills development.

3.1.2 Instruments

A structured questionnaire was developed to examine entrepreneurial problems, expectations, and learning experiences. Content validity was evaluated by five experts using the Index of Item-Objective Congruence (IOC), with scores ranging from 0.80 to 1.00. A semi-structured interview guide was also validated through expert review.

3.1.3 Data Collection and Analysis

Survey data were analyzed using descriptive statistics (mean, standard deviation, frequencies, percentages), while interview transcripts were thematically coded. Quantitative and qualitative findings were integrated through a convergent mixed-methods approach, providing a comprehensive basis for informing curriculum design.
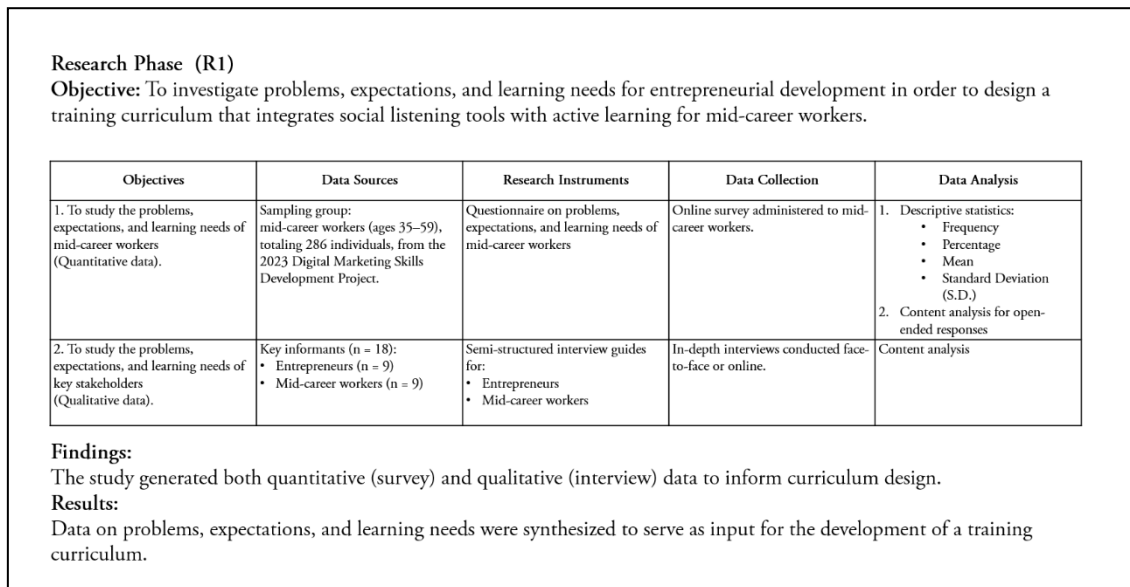
Research Phase (R1)
Objective: To investigate problems, expectations, and learning needs for entrepreneurial development in order to design a training curriculum that integrates social listening tools with active learning for mid-career workers.

Objectives	Data Sources	Research Instruments	Data Collection	Data Analysis
1. To study the problems, expectations, and learning needs of mid-career workers (Quantitative data).	Sampling group: mid-career workers (ages 35–59), totaling 286 individuals, from the 2023 Digital Marketing Skills Development Project.	Questionnaire on problems, expectations, and learning needs of mid-career workers	Online survey administered to mid-career workers.	1. Descriptive statistics: • Frequency • Percentage • Mean • Standard Deviation (S.D.) 2. Content analysis for open-ended responses
2. To study the problems, expectations, and learning needs of key stakeholders (Qualitative data).	Key informants (n = 18): • Entrepreneurs (n = 9) • Mid-career workers (n = 9)	Semi-structured interview guides for: • Entrepreneurs • Mid-career workers	In-depth interviews conducted face-to-face or online.	Content analysis

Findings:
The study generated both quantitative (survey) and qualitative (interview) data to inform curriculum design.
Results:
Data on problems, expectations, and learning needs were synthesized to serve as input for the development of a training curriculum.

Figure 2. Need Assessment (R1)

3.2 Phase 2: Curriculum Development (D1)

3.2.1 Participants

Five experts in entrepreneurship education and curriculum design were purposively selected to evaluate the draft curriculum.

3.2.2 Instruments

The draft curriculum was constructed through a systematic literature review of scholarly databases such as Scopus, ERIC, and Project Muse. The review identified theoretical frameworks, best practices, and instructional models relevant to entrepreneurship education, digital technologies, and active learning. The preliminary curriculum was further refined through expert validation forms. Content validity was assessed using IOC, with all items exceeding the 0.80 threshold.

3.2.3 Data Collection and Analysis

Curriculum drafts were revised iteratively based on expert feedback until consensus was reached, ensuring theoretical rigor, practical applicability, and alignment with adult learning principles.
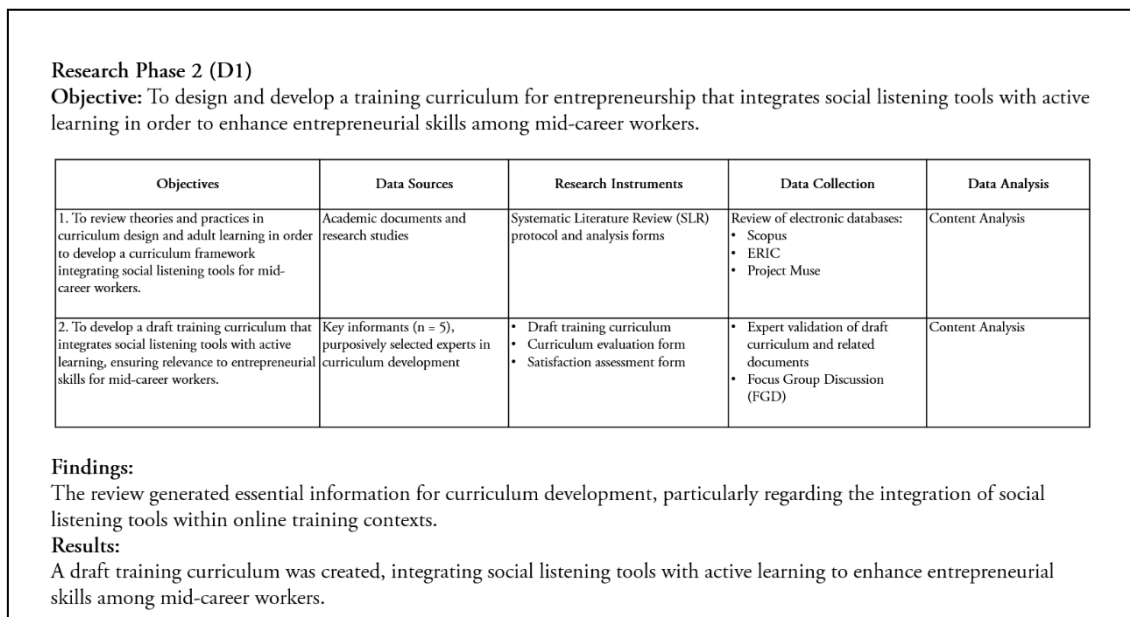
Research Phase 2 (D1)
Objective: To design and develop a training curriculum for entrepreneurship that integrates social listening tools with active learning in order to enhance entrepreneurial skills among mid-career workers.

Objectives	Data Sources	Research Instruments	Data Collection	Data Analysis
1. To review theories and practices in curriculum design and adult learning in order to develop a curriculum framework integrating social listening tools for mid-career workers.	Academic documents and research studies	Systematic Literature Review (SLR) protocol and analysis forms	Review of electronic databases: • Scopus • ERIC • Project Muse	Content Analysis
2. To develop a draft training curriculum that integrates social listening tools with active learning, ensuring relevance to entrepreneurial skills for mid-career workers.	Key informants (n = 5), purposively selected experts in curriculum development	• Draft training curriculum • Curriculum evaluation form • Satisfaction assessment form	• Expert validation of draft curriculum and related documents • Focus Group Discussion (FGD)	Content Analysis

Findings:
The review generated essential information for curriculum development, particularly regarding the integration of social listening tools within online training contexts.
Results:
A draft training curriculum was created, integrating social listening tools with active learning to enhance entrepreneurial skills among mid-career workers.

Figure 3. Curriculum Development (D1)

3.3 Phase 3: Pilot Implementation (R2)

3.3.1 Participants

Three pilot cohorts of mid-career workers (n = 9, 15, and 30) participated sequentially to enable iterative refinement of the curriculum.

The pilot sample sizes of 9, 15, and 30 participants were appropriate for research and development studies in curriculum design. These studies emphasize iterative refinement and the close examination of learner responses rather than statistical generalization. The initial small groups enabled detailed observation of how participants engaged with each module and allowed for efficient revision of content and activities. The larger cohort of 30 participants provided sufficient data to assess instructional efficiency, test reliability, and overall feasibility. This progressive expansion of sample size is consistent with established practices in educational design research because it supports both formative improvement and summative evaluation.

3.3.2 Instruments

The training modules, knowledge achievement tests, and self-assessment scales were utilized. The knowledge test's reliability was confirmed with a Kuder-Richardson Formula 20 (KR-20) coefficient of 0.82, while the self-assessment scale achieved a Cronbach's alpha of 0.85.

3.3.3 Data Collection and Analysis

A pretest–posttest design with dependent-sample t-tests measured changes in entrepreneurial knowledge, skills, and attitudes. Efficiency indices (E1/E2) were calculated, while item difficulty and discrimination analyses ensured test quality. Results from each cohort were used to inform modifications to the curriculum.

Research Phase 3 (R2)
Objective: To pilot the implementation of the training curriculum that integrates social listening tools with active learning, aimed at enhancing entrepreneurial skills among mid-career workers.

Objectives	Data Sources	Research Instruments	Data Collection	Data Analysis
To pilot-test the training curriculum integrating social listening tools with active learning for enhancing entrepreneurial skills among mid-career workers.	Participants in the pilot study: mid-career workers from the 2023 Digital Marketing Skills Development Project. • Trial group 1: 9 person • Trial group 2: 15 people • Main pilot group (Trial 3): 30 people	1. Training curriculum integrating social listening tools with active learning for entrepreneurship. 2. Knowledge test (pre–post). 3. Skills assessment form (pre–post) 4. Attitude questionnaire (pre–post)	1. Online training program 2. Pre-training self-assessment 3. Implementation of the training curriculum 4. Post-training evaluation	1. Descriptive statistics: • Percentage • Mean • Standard Deviation (S.D.) 2. Paired-sample t-test (pre–post) 3. Effectiveness index (E1/E2)

Results:
The pilot implementation confirmed the feasibility and effectiveness of the training curriculum integrating social listening tools with active learning to enhance entrepreneurial skills among mid-career workers.

Figure 4. Pilot Implementation (R2)

3.4 Phase 4: Evaluation (D2)

3.4.1 Participants

A final group of 30 mid-career workers, distinct from the pilot cohorts, participated in the summative evaluation.

3.4.2 Instruments

Finalized versions of the achievement tests, self-assessment scales, and satisfaction surveys were administered. Reliability coefficients were high, with KR-20 = 0.84 for the knowledge test and Cronbach's alpha = 0.88 for the satisfaction scale.

3.4.3 Data Collection and Analysis

Dependent-sample *t*-tests compared pre- and post-training scores, while efficiency indices (E1/E2) measured instructional effectiveness. Satisfaction scores were averaged to assess overall learner experience, and qualitative reflections from participants were incorporated to contextualize quantitative outcomes.
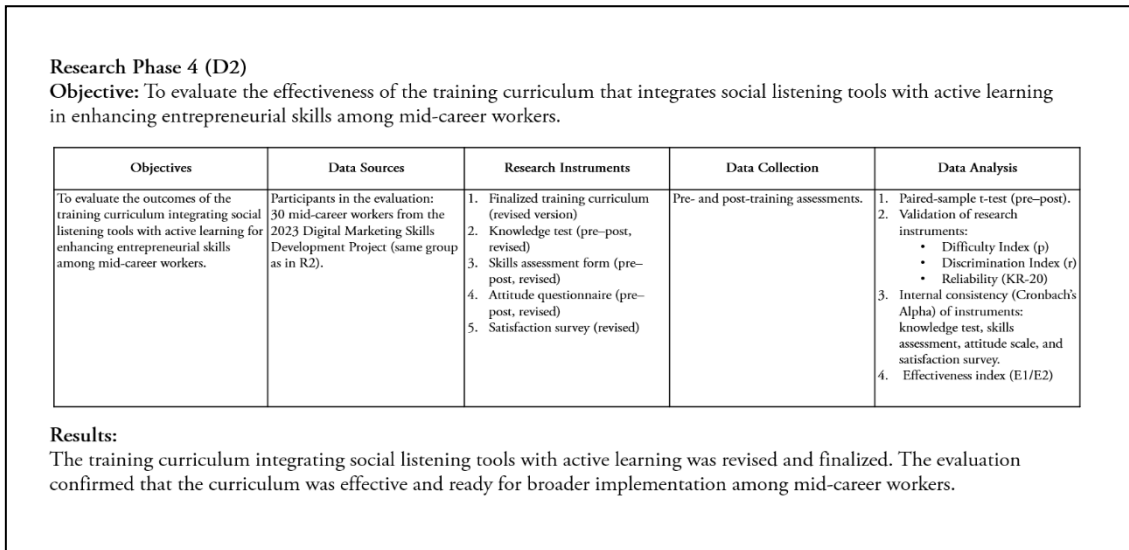
Research Phase 4 (D2)
Objective: To evaluate the effectiveness of the training curriculum that integrates social listening tools with active learning in enhancing entrepreneurial skills among mid-career workers.

Objectives	Data Sources	Research Instruments	Data Collection	Data Analysis
To evaluate the outcomes of the training curriculum integrating social listening tools with active learning for enhancing entrepreneurial skills among mid-career workers.	Participants in the evaluation: 30 mid-career workers from the 2023 Digital Marketing Skills Development Project (same group as in R2).	1. Finalized training curriculum (revised version) 2. Knowledge test (pre–post, revised) 3. Skills assessment form (pre–post, revised) 4. Attitude questionnaire (pre–post, revised) 5. Satisfaction survey (revised)	Pre- and post-training assessments.	1. Paired-sample t-test (pre–post). 2. Validation of research instruments: • Difficulty Index (p) • Discrimination Index (r) • Reliability (KR-20) 3. Internal consistency (Cronbach's Alpha) of instruments: knowledge test, skills assessment, attitude scale, and satisfaction survey. 4. Effectiveness index (E1/E2)

Results:
The training curriculum integrating social listening tools with active learning was revised and finalized. The evaluation confirmed that the curriculum was effective and ready for broader implementation among mid-career workers.

Figure 5. Evaluation (D2)

4. Results

4.1 Phase 1: Needs Assessment (R1)

The needs assessment phase involved 286 mid-career workers and 18 key informants. Quantitative results showed that participants' primary problems were insufficient knowledge of business administration ($M = 3.95$, $SD = 1.17$) and business management ($M = 3.57$, $SD = 0.80$), followed by limitations in marketing ($M = 3.37$, $SD = 0.82$), difficulties in commercializing business ideas ($M = 3.15$, $SD = 0.85$), and challenges in accessing financial resources ($M = 3.14$, $SD = 0.99$).

Qualitative interviews with 18 informants confirmed these findings, emphasizing issues in cost management, access to funding, competition, brand development, and the need for updated digital marketing and social listening skills. Overall, the findings highlighted the demand for practice-oriented, digitally supported, and mentorship-based training for mid-career workers.

Table 1. Problems in Starting a Business among Mid-Career Workers

Problem Area	Mean (M)	SD	Interpretation	Rank
Business administration	3.95	1.17	High	1
Business management	3.57	0.80	High	2
Marketing	3.37	0.82	Moderate	3
Commercialization of ideas	3.15	0.85	Moderate	4
Access to financial resources	3.14	0.99	Moderate	5

4.2 Phase 2: Curriculum Development (D1)

The second phase focused on designing and validating a training curriculum tailored to the entrepreneurial development needs of mid-career workers. The process began with a systematic literature review (SLR) across international databases such as Scopus, ERIC, and Project Muse, which identified theoretical frameworks, instructional strategies, and empirical findings in entrepreneurship education, adult learning, and digital skill development. The review confirmed that integrating social listening tools as digital resources with active learning methods as pedagogical strategies would provide a strong foundation for addressing the skill gaps identified in Phase 1.

Based on the review and needs assessment results, a draft curriculum was developed comprising six units: (1) Entrepreneurial Mindset, (2) Digital Consumer Analysis, (3) Social Listening Applications, (4) Opportunity Recognition, (5) Problem-Solving with Active Learning, and (6) Business Planning and Integration.

To ensure validity, the draft curriculum was reviewed by five experts in entrepreneurship education and curriculum design. Each unit was evaluated for relevance, clarity, and appropriateness using the Item-Objective Congruence (IOC) index. Results showed IOC values ranging from 0.80 to 1.00, exceeding the accepted threshold of 0.80. Qualitative feedback suggested strengthening the use of real-world case studies, expanding social listening practice sessions, and enhancing group-based simulations. The draft was revised accordingly through iterative expert consultation.

The validated curriculum demonstrated both content validity and practical alignment with the learning needs of mid-career workers, serving as a structured model for subsequent pilot implementation.

Table 2. Expert Validation of the Draft Curriculum (IOC)

Curriculum Unit	No. of Items	IOC Range	IOC Mean	Expert Comments
Entrepreneurial Mindset	8	0.80 – 1.00	0.92	Emphasize resilience and adaptability
Digital Consumer Analysis	10	0.83 – 1.00	0.91	Include practical social media cases
Social Listening Applications	12	0.82 – 1.00	0.93	Demonstrate tools with real datasets
Opportunity Recognition	9	0.84 – 1.00	0.90	Link to local business contexts
Problem-Solving with Active Learning	7	0.85 – 1.00	0.92	Add simulations and role-play
Business Planning and Integration	11	0.80 – 1.00	0.91	Connect to entrepreneurship ecosystem

4.3 Pilot Implementation (R2)

The pilot implementation aimed to examine the effectiveness of the draft curriculum and refine its instructional components. Three successive groups of mid-career workers (n = 9, 15, and 30) participated in the pilot training. A pretest–posttest design was employed to measure changes in entrepreneurial knowledge, skills, and attitudes.

Results indicated that the curriculum substantially improved participants' entrepreneurial competencies. Pretest scores for the largest pilot cohort averaged 17.97 points (59.89%), while posttest scores increased to 26.43 points (88.00%), with statistically significant differences ($p < .001$). Reliability analysis confirmed the robustness of the instruments, with KR-20 $\geq$ 0.82 for knowledge tests and Cronbach's $\alpha \geq$ 0.85 for self-assessment scales.

Instructional efficiency, evaluated using the E1/E2 index, exceeded the 80/80 benchmark across all groups. Specifically, Group 1 achieved E1 = 82.96, E2 = 84.81; Group 2 achieved E1 = 80.66, E2 = 82.00; and Group 3 achieved E1 = 92.56, E2 = 88.11. These results demonstrate the curriculum's effectiveness in both instructional process and learning outcomes.

Table 3. Comparison of Pretest and Posttest Scores in Pilot Groups

Group	N	Pre-test	Post-test	t(df)	p
1	9	15.97	26.43	$t(8) = 9.72$	< .001
2	15	16.20	27.05	$t(14) = 10.49$	< .001
3	30	17.97	26.43	$t(29) = 8.46$	< .001

Table 4. Efficiency Indices (E1/E2) of Pilot Groups

Group	N	E1 (%)	E2 (%)	Interpretation
1	9	82.96	84.81	Above standard
2	15	80.66	82.00	Meets standard
3	30	92.56	88.11	Exceeds standard

Note. E1 = process efficiency; E2 = outcome efficiency. Benchmark set at 80/80.

4.4 Phase 4: Evaluation (D2)

The final evaluation confirmed that the fully revised curriculum produced a significant improvement in entrepreneurial knowledge and skills. Learners in the final cohort demonstrated a statistically significant increase in their posttest performance compared with the pretest, $t(29) = 8.46$, $p < .001$. Unlike the pilot phase, which focused on iterative refinement and identification of content gaps, the final evaluation assessed the effectiveness of the complete curriculum. The results indicate that the finalized training model successfully supported learning in an authentic implementation setting.

Compared with the pilot iterations, the final cohort demonstrated more stable learning patterns and stronger alignment with the instructional design objectives. This suggests that revisions made during Phase 3, including clearer task instructions, refined social listening datasets, and increased opportunities for guided practice, contributed substantially to the effectiveness of the curriculum.

Table 5. Comparison of Pretest and Posttest Scores

Test	Mean	SD	t	p
Pre-test	17.97	4.63		
Post-test	26.43	1.54	$t(29) = 8.46$	< .001

Note. Paired-sample t-test with 29 degrees of freedom, $p < 0.001$.

Curriculum efficiency: the final implementation demonstrated high instructional efficiency, with E1 = 92.56 and E2 = 88.11, both exceeding the 80/80 benchmark.

Instrument quality: the knowledge test demonstrated strong reliability (KR-20 = 0.84), while the satisfaction scale showed high internal consistency (Cronbach's α = 0.88). Item difficulty and discrimination indices fell within acceptable ranges, ensuring test quality.

Learner satisfaction: participants rated the curriculum at the highest level, with an overall mean of 4.63 out of 5.00, classified as "very high." Dimensions such as learning relevance, practicality, trainer competence, and interactive activities all exceeded the 4.50 benchmark.

Table 6. Efficiency, Reliability, and Satisfaction

Indicator	Value	Standard / Benchmark	Interpretation
E1 (Process efficiency)	92.56	≥ 80	Exceeds benchmark
E2 (Outcome efficiency)	88.11	≥ 80	Exceeds benchmark
KR-20 (Knowledge test)	0.84	≥ 0.70	High reliability
Cronbach's α (Satisfaction)	0.88	≥ 0.70	High reliability
Satisfaction (Mean)	4.63	4.51–5.00	Very high

Self-assessment: participants reported noticeable improvements in entrepreneurial competencies across several domains. The highest gains were observed in opportunity recognition ($M = 4.58$), problem-solving ($M = 4.55$), and adaptability in digital contexts ($M = 4.52$). These results support the quantitative evidence, indicating that the curriculum not only improved knowledge but also enhanced practical entrepreneurial skills and attitudes.

Qualitative feedback: open-ended responses reinforced these findings. Participants highlighted that "using real-time data from social media listening helped us understand customers more clearly," and that "the group-based activities motivated us to think and solve problems like real entrepreneurs." Such reflections illustrate the curriculum's perceived relevance and applicability.

5. Discussion

The results of the three pilot iterations and the final implementation demonstrate that the curriculum effectively enhanced learners' entrepreneurial knowledge and applied analytical skills. Rather than reflecting simple score improvements, the patterns observed across cohorts indicate that learners became increasingly capable of interpreting digital consumer signals and using these insights to inform opportunity identification (Renko et al., 2012). This suggests that integrating real social listening data into active learning activities supports deeper cognitive engagement and meaningful skill development among mid-career wokers (Ceptureanu et al., 2020; Prachumrasee et al., 2024) .

The findings align with adult learning theory, which emphasizes experiential, problem-centered, and practice-oriented learning. Learners benefited from opportunities to work with real digital market data, collaborate in small groups, and reflect on their interpretations, which likely strengthened their decision-making and insight-generation abilities. The results further support literature on active learning, which proposes that participation in structured tasks promotes higher-order thinking and adaptive expertise (Merriam & Bierema, 2013; Prince, 2004; Silberman & Biech, 2015). In this study, social listening functioned not merely as a technical tool but as a mechanism for promoting analytical reasoning, pattern recognition, and data-informed judgment.

The consistency of outcomes across all pilot groups indicates that revisions made throughout the development process contributed meaningfully to the curriculum's effectiveness (Dick, 1996). Adjustments such as clearer task instructions, improved datasets, and expanded practice opportunities appear to have strengthened learners' confidence and engagement. The final evaluation confirms that the curriculum design is appropriate for mid-career adults who require practical methods for navigating digital information environments and recognizing entrepreneurial opportunities (Anderson et al., 2021; Brown, 2015).

Several limitations should be considered when interpreting these findings. The sample consisted exclusively of mid-career workers, which limits the generalizability of the results to broader adult learning populations. Participants also had prior exposure to digital training programs, which may have increased their readiness for technology-based learning activities. The evaluation focused on short-term pre–post measures rather than long-term follow-up, and therefore cannot determine whether learning gains translate into sustained entrepreneurial behavior. In addition,

interpretations of social listening data may vary across learners and contexts. These limitations indicate the need for further research with more diverse participant groups, extended evaluation periods, and multiple implementation settings (Jeyakumar et al., 2024; Kirkpatrick & Kirkpatrick, 2016).

6. Conclusion and Recommendations

The study contributes to entrepreneurship education by offering a curriculum model that connects experiential learning with real-time market insight. Existing models often rely on simulated cases or static datasets, whereas the present framework incorporates authentic digital signals to support opportunity recognition, decision making, and reflective learning. From a practical perspective, the curriculum addresses the needs of mid-career workers by providing flexible online delivery, clear task structures, and guided analytic processes that align with adult learning principles.

Several limitations should be acknowledged. The sample consisted of mid-career workers with prior exposure to digital training, which may limit generalizability to broader adult populations. The evaluation relied on short-term pre–post assessments and did not include follow-up measures to examine long-term behavioral transfer. Self-reported data may also introduce bias, although this was mitigated through triangulation with performance assessments.

Future research could examine long-term entrepreneurial outcomes, including opportunity identification, business planning behavior, and actual venture creation. Further studies should also explore how the curriculum performs across different demographic segments, industries, and delivery formats. Expanding the model to incorporate AI-assisted analytics or enhanced collaborative tools may further strengthen its relevance in rapidly evolving digital environments.

Overall, the study contributes a theory-informed and empirically validated curriculum framework that demonstrates how digital market intelligence can be systematically integrated with experiential pedagogy to support entrepreneurial capacity-building among mid-career adults.

Authors contributions

Suwicha Wittayakom was responsible for the study conception, research design, data collection, data analysis, interpretation of findings, and drafting of the manuscript. Chintana Kanjanavisut contributed to the development of the methodological approach, refinement of the analytical framework, and critical review of the manuscript for intellectual content. Methinee Wongwanich Rumpagaporn contributed to the theoretical development, interpretation of results, and substantive revisions to improve the clarity and coherence of the manuscript. All authors discussed the results, contributed to the final version, and approved the final manuscript.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper..

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