

Designing Adaptive Learning Experiences for Generation Z in the Gig Economy

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ABSTRACT

Background. The expansion of the gig economy has reshaped conventional career pathways and increased the need for Generation Z to develop adaptive, digital, entrepreneurial, and self-directed career competencies. Traditional career counseling, however, often remains oriented toward occupational information and linear employment pathways.

Purpose. This study aimed to design and evaluate an Adaptive Career Learning Experience (ACLE) to strengthen Generation Z's readiness for flexible, digital, and non-traditional careers..

Method. Educational Design Research was employed through analysis and exploration, design and construction, and evaluation and reflection. Participants included 180 university students for needs analysis, seven experts for validation, 24 students for a small-group trial, and 120 students for field evaluation. ACLE was structured through five stages: Explore, Adapt, Build, Simulate, and Reflect..

Novelty. The study reconceptualizes career preparation as an instructional design framework integrating adaptive learning, authentic career simulation, digital-professional competence, entrepreneurial readiness, and reflective career planning.

Results. Expert validation indicated high content validity, with Aiken's V ranging from 0.86 to 0.94. Students participating in ACLE showed significantly greater improvements than the comparison group in career adaptability, digital career competence, entrepreneurial readiness, career self-efficacy, and gig economy career readiness ($p < .001$).

Conclusion. ACLE offers an effective framework for shifting career preparation beyond conventional counseling toward adaptive, authentic, and experiential learning that better prepares Generation Z for digitally mediated and non-linear career environments.

KEYWORDS

Adaptive Learning; Career Readiness; Generation Z; Gig Economy; Instructional Design

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INTRODUCTION

Rapid technological development, digital transformation, and the expansion of platform-based economic systems have significantly changed the structure of employment across the world. Conventional career patterns characterized by permanent employment, long-term organizational attachment, and predictable, occupational progression are increasingly being accompanied by flexible, project-based, remote, and digitally mediated forms of work (Lucciarini & Bellini, 2026; Mahmudnia et al., 2026; Saraiva & Nogueiro, 2025). Digital labor platforms, freelance marketplaces, online entrepreneurship, content-based industries, and remote

specialization alone toward adaptability, digital competence, entrepreneurial capability, self-management.

These global changes are particularly relevant to Generation Z, a cohort entering the labor market in an environment shaped by digital technologies, social media, online platforms, and increasingly fluid employment structures. Generation Z tends to demonstrate greater familiarity with technology, stronger exposure to entrepreneurial opportunities, and greater openness to flexible and non-traditional forms of work (Hamdi et al., 2023; Mudinillah et al., 2024). Their career possibilities increasingly extend beyond conventional organizational employment to freelancing, digital entrepreneurship, content creation, remote consulting, platform-mediated services, and portfolio careers. Consequently, career preparation for this generation can no longer be limited to helping individuals select occupations or prepare for conventional recruitment processes. Young people need opportunities to develop the capacity to navigate uncertainty, construct professional identities, recognize emerging opportunities, and continuously adapt their skills to changing labor market conditions (Jagannathan et al., 2019).

Similar changes are increasingly relevant within Indonesia, where digitalization, online economic activities, social media-based entrepreneurship, remote work, and platform-mediated services have expanded alternative employment possibilities for young people. University students and young graduates are increasingly exposed to career options that do not necessarily follow traditional pathways into permanent organizational employment (Testa et al., 2026; Tran et al., 2025). This changing environment creates both opportunities and challenges for higher education institutions. Students may have greater access to flexible work opportunities, but they must also assume greater responsibility for developing their own skills, professional networks, digital identities, income strategies, and long-term career sustainability.

The situation is also relevant in Aceh, where university students and young adults are increasingly connected to digital technologies and broader online labor markets. Geographic boundaries no longer fully determine access to employment opportunities because freelance platforms, digital businesses, remote services, and online professional networks allow young people to engage with labor markets beyond their immediate local environment. For Generation Z in Aceh, this transformation may create new opportunities to develop careers without relying exclusively on conventional employment structures. Digital entrepreneurship, freelance services, creative industries, online education, content production, and other forms of digitally mediated work may provide alternative pathways for economic participation and professional development (Erwin & Kuswandi, 2024; He et al., 2023).

However, access to digital opportunities does not automatically translate into readiness to participate effectively in the gig economy. Young people may be familiar with digital technologies while still lacking the competencies required to manage non-traditional careers. Successful participation in gig and flexible employment requires more than technical familiarity with digital platforms. Individuals need career adaptability, digital career competence, entrepreneurial thinking, professional self-efficacy, personal branding, networking skills, project management capabilities, and the ability to manage uncertainty and continuous career transitions (Athar et al., 2025; Sutherland et al., 2020). Without structured preparation, Generation Z may enter flexible labor markets without sufficient capacity to evaluate opportunities, manage professional risks, build sustainable career strategies, or adapt to rapidly changing work demands.

This challenge becomes increasingly important in the context of higher education and career preparation in Aceh (Muluk et al., 2019). Career guidance and counseling practices within educational institutions have traditionally emphasized occupational choice, educational planning, job application preparation, and entry into relatively stable employment. These functions remain important, but they may not fully reflect the realities of contemporary labor markets characterized by freelancing, project-based employment, digital entrepreneurship, multiple career roles, and continuous occupational transitions. Conventional career counseling may therefore provide students

with career information without necessarily creating sufficient opportunities to practice the competencies required for non-linear and digitally mediated careers.

A central problem lies in the predominantly advisory nature of many career preparation practices. Students may receive information about career opportunities, curriculum vitae preparation, interviews, job vacancies, and occupational choices, but such activities do not always provide authentic learning experiences through which they can develop and apply adaptive career competencies. Knowing about freelancing, entrepreneurship, or digital careers is different from being able to identify opportunities, develop a professional portfolio, communicate with clients, negotiate project requirements, manage digital reputations, make career decisions under uncertainty, and continuously reconstruct career strategies. These capabilities require systematic learning experiences involving active participation, authentic tasks, feedback, reflection, and repeated practice.

The gap is therefore not merely a lack of career information, but a mismatch between the way career preparation is traditionally delivered and the competencies demanded by emerging labor market structures. Existing career counseling approaches frequently remain rooted in assumptions of relatively stable occupational pathways (Savickas et al., 2009). Contemporary career environments, however, require individuals to become active agents in constructing, adapting, and sustaining their careers. Career success increasingly depends on adaptability, self-efficacy, entrepreneurial competence, digital literacy, professional identity development, and self-directed career management rather than organizational loyalty alone.

Research on career development has extensively examined career adaptability, self-efficacy, employability, occupational exploration, and career decision-making. Studies on the gig economy have also examined worker autonomy, employment flexibility, digital platform work, economic opportunity, job insecurity, and labor market transformation. Research concerning Generation Z commonly discusses changing attitudes toward employment, technology use, entrepreneurship, and flexible work preferences. These bodies of literature provide important insights into the characteristics of contemporary careers, yet they often focus on identifying determinants, preferences, or outcomes rather than examining how the competencies required for non-traditional careers can be intentionally developed through structured learning experiences.

A further research gap concerns the limited integration between career development and instructional design. Career adaptability, digital competence, entrepreneurial readiness, and career self-efficacy are often treated as psychological or employability variables that predict career outcomes. Less attention has been given to how these capabilities can be translated into explicit learning objectives, sequenced instructional activities, authentic career tasks, formative feedback, reflective processes, and assessments. As a result, existing research provides considerable knowledge about what Generation Z needs to succeed in changing labor markets, but relatively limited guidance regarding how learning experiences should be designed to systematically develop those capabilities.

This gap is particularly important when career preparation is considered within the context of Generation Z in Aceh. The increasing accessibility of digital labor markets creates opportunities that extend beyond local employment structures, but benefiting from these opportunities requires an educational response that goes beyond conventional career guidance. Students need learning environments in which they can explore emerging career pathways, practice digital professional activities, develop entrepreneurial capabilities, strengthen adaptive career resources, and experience realistic situations associated with flexible and project-based work. Career preparation therefore needs to move from a predominantly informational and advisory orientation toward a more experiential, adaptive, and learner-centered model.

Within this approach, adaptive learning does not merely refer to technology-driven personalization. It refers more broadly to learning experiences that respond to differences in learners' career aspirations, existing competencies, readiness levels, and professional contexts. An adaptive career learning experience may involve career exploration, identification of individual strengths and competency gaps, development of digital career skills, entrepreneurial problem-

solving, professional portfolio construction, simulation of freelance or project-based work, reflective activities, and adaptive career planning (Erwin et al., 2026). These elements allow students to connect career knowledge with authentic action.

The present study therefore adopts an instructional design perspective to move beyond traditional career counseling and develop adaptive learning experiences for Generation Z in the context of the gig economy. Career Construction Theory, Career Adaptability Theory, and Social Cognitive Career Theory provide theoretical foundations for understanding how individuals construct career identities, develop adaptive resources, strengthen self-efficacy, and respond to changing career environments (Rudolph et al., 2019). These theoretical perspectives are integrated with instructional design principles to translate career development competencies into intentional learning objectives, activities, authentic tasks, feedback mechanisms, and reflective processes.

The study specifically aims to design and examine an adaptive career learning experience that addresses the needs of Generation Z in Aceh as they prepare for increasingly flexible, digital, and non-traditional career pathways. The proposed approach focuses on developing career adaptability, digital career competence, entrepreneurial readiness, and career self-efficacy through structured and authentic learning activities related to contemporary work environments. Rather than positioning learners as passive recipients of career advice, the design places them as active participants who explore, practice, reflect, make decisions, and continuously adapt their career strategies.

The study is expected to contribute theoretically by connecting career development perspectives with instructional design and by reframing career readiness as an outcome that can be intentionally developed through designed learning experiences. Practically, the study is expected to provide a framework for universities, career counselors, educators, and instructional designers in Aceh and similar contexts to develop career preparation programs that are more responsive to contemporary employment realities. By moving beyond traditional career counseling toward adaptive and experiential career learning, the study seeks to support Generation Z in developing the capabilities necessary to navigate the uncertainty, flexibility, and opportunities associated with the gig economy.

RESEARCH METHODOLOGY

Research Design

This study employed Educational Design Research (EDR) to develop and evaluate an adaptive career learning experience for Generation Z in the gig economy. EDR was selected because it supports the systematic development of educational interventions through iterative processes of analysis, design, evaluation, and refinement (McKenney & Reeves, 2025). The study consisted of three phases: analysis and exploration, design and construction, and evaluation and reflection.

The developed intervention, termed the Adaptive Career Learning Experience (ACLE), followed five instructional stages: Explore, Adapt, Build, Simulate, and Reflect. These stages were designed to strengthen career adaptability, digital career competence, entrepreneurial readiness, career self-efficacy, and gig economy career readiness through authentic and experiential learning activities (Herrington et al., 2003).

Research Participants

This research was conducted at selected higher education institutions in Aceh, Indonesia, involving Generation Z undergraduate students aged 18-25. Participants were selected based on the needs of each phase of the research.

Tabel 1. Participants

Research Stage	Participants	Number
Needs analysis	University students	180
Expert validation	Instructional design, career counseling, and digital entrepreneurship experts	7
Small-group trial	University students	24
Field evaluation	Experimental and comparison groups	120

Purposive sampling was used during the exploratory and validation stages to ensure that participants had relevant knowledge and experience related to the research objectives (Creswell & Poth, 2018). The field evaluation involved 60 students in the experimental group and 60 students in the comparison group.

Research Instruments

Data were collected using a career learning needs questionnaire, Career Adapt-Abilities Scale, career self-efficacy scale, digital career competence scale, entrepreneurial readiness scale, and gig economy career readiness scale. Career adaptability was measured based on the dimensions of concern, control, curiosity, and confidence developed by Savickas and Porfeli (2012). Career self-efficacy was adapted from the Career Decision-Making Self-Efficacy framework (Xin et al., 2020). Additional instruments included expert-validation sheets, observation protocols, learner-response questionnaires, reflective journals, interview guides, and performance rubrics. Researcher-developed instruments were validated through expert judgment, with Aiken's V used to assess content validity where appropriate (Aiken, 1985).

Research Procedure

The research was conducted in three stages. First, the analysis and exploration phase identified students' career needs, competency gaps, perceptions of the gig economy, and limitations of existing career preparation practices. Second, the design and construction phase developed the ACLE model through five stages: Explore-Adapt-Build-Simulate-Reflect. The prototype was reviewed by experts and revised before being tested with a small group of students.

Third, the evaluation and reflection phase implemented the refined model in the field. The experimental group participated in ACLE, while the comparison group followed conventional career preparation activities. Pretest and posttest data were used to examine changes in career adaptability, digital career competence, entrepreneurial readiness, career self-efficacy, and gig economy career readiness. The overall procedure was:

Needs Analysis → ACLE Design → Expert Validation → Small-Group Trial → Revision → Field Implementation → Evaluation → Final Refinement

RESULT AND DISCUSSION

Results

The needs analysis involving 180 Generation Z students in Aceh revealed a clear gap between students' awareness of emerging career opportunities and their preparedness to participate in them. Although 68.3% of participants were familiar with freelancing, digital entrepreneurship, or platform-based work, only 36.7% reported receiving structured career preparation related to non-traditional employment. Students reported the greatest needs in digital professional identity, opportunity recognition, portfolio development, client communication, entrepreneurial decision-making, and adaptive career planning.

These findings indicated that conventional career preparation remained largely informational and provided limited opportunities for students to practice career-related competencies in authentic situations. The needs analysis therefore generated five core design requirements: career exploration, adaptability development, digital-professional competence, authentic gig-work simulation, and

reflective career planning. These requirements were translated into the five-stage Adaptive Career Learning Experience (ACLE): Explore Adapt, Build, Simulate, and Reflect.

Seven experts evaluated the relevance, coherence, instructional sequence, authenticity, adaptivity, and assessment components of ACLE. The validation results demonstrated strong content validity, with Aiken's V coefficients ranging from 0.86 to 0.94. The highest ratings were obtained for the relevance of authentic career tasks and the alignment between learning activities and expected career competencies. The small-group trial involving 24 students also indicated high practicality and positive learner responses.

Table 2. Validation and Preliminary Evaluation of ACLE

Evaluation Aspect	Result Interpretation
Expert validation	$V = 0.86-0.94$ High validity
Instructional relevance	$V = 0.92$ High validity
Authenticity of learning tasks	$V = 0.94$ High validity
Small-group practicality	4.32/5.00 Very practical
Learner engagement	4.38/5.00 Very high
Perceived relevance	4.41/5.00 Very high

Students particularly valued activities involving digital portfolio construction, gig-opportunity analysis, client-project simulation, and adaptive career planning. Minor revisions were made to task instructions, learning duration, and feedback mechanisms before the field implementation. The field evaluation involved 120 students, consisting of an experimental group participating in ACLE ($n = 60$) and a comparison group receiving conventional career preparation ($n = 60$). Both groups completed pretest and posttest assessments.

The experimental group demonstrated greater improvement across all five measured competencies.

Table 3. Pretest and Posttest Results of the Field Evaluation

Variable	Experimental Pretest	Experimental Posttest	Comparison Pretest	Comparison Posttest
Career Adaptability	3.42	4.31	3.45	3.67
Digital Career Competence	3.51	4.38	3.49	3.72
Entrepreneurial Readiness	3.36	4.19	3.39	3.61
Career Self-Efficacy	3.47	4.34	3.44	3.70
Gig Economy Career Readiness	3.31	4.36	3.34	3.63

The strongest improvement was observed in gig economy career readiness, followed by digital career competence and career adaptability. Inferential analysis showed that the experimental group achieved significantly stronger post-intervention outcomes than the comparison group across the measured dimensions ($p < .001$). The findings suggest that ACLE was more effective than conventional career preparation because students were not merely exposed to information about careers. They actively explored opportunities, practiced digital-professional competencies, responded to realistic career problems, received feedback, and developed individualized career strategies.

Qualitative findings from observations, reflective journals, and interviews identified three major patterns. First, students experienced a shift from career awareness to career agency. At the beginning of the intervention, many students understood freelancing and digital entrepreneurship primarily as alternative sources of income. After completing ACLE, they demonstrated a more strategic understanding of professional identity, competency development, portfolio building, networking, and long-term career sustainability. Second, authentic simulation emerged as the most influential learning component. Activities involving client briefs, service propositions, digital

portfolios, opportunity analysis, and project-based problem solving helped students connect abstract career concepts with realistic professional decisions.

The improvement in career adaptability was particularly important. Through the Explore and Adapt stages, students encountered changing labor-market scenarios, examined alternative career pathways, and developed strategies for responding to uncertainty. This finding is consistent with the career adaptability framework of Savickas and Porfeli, which emphasizes concern, control, curiosity, and confidence as essential psychosocial resources for managing career transitions (Hartung et al., 2008). The present findings extend this perspective by demonstrating that adaptability can be intentionally embedded as an instructional outcome rather than treated only as an individual psychological characteristic.

Digital career competence also showed substantial development. The Build stage required students to construct digital professional identities, portfolios, networks, and service propositions. Digital competence in this context was therefore not limited to technical proficiency. It functioned as a career resource enabling students to communicate professional value, access opportunities, develop networks, and participate in digitally mediated labor markets.

The development of career self efficacy can be explained by the experiential structure of the intervention. Students repeatedly completed increasingly authentic career tasks and received feedback on their performance. This process is consistent with Social Cognitive Career Theory, which emphasizes the importance of learning experiences and self-efficacy beliefs in shaping career-related actions and choices (Lent et al., 2017; Lent & Brown, 2019). Successful engagement with realistic career tasks appears to have strengthened students' confidence in their ability to navigate unfamiliar and uncertain employment situations.

A particularly important finding concerns the role of authentic simulation. Students reported that simulated gig projects, client briefs, portfolio construction, and opportunity analysis were among the most meaningful learning activities. This supports the principles of authentic learning, which emphasize realistic problems, contextualized tasks, multiple perspectives, reflection, and application of knowledge in practice-oriented environments (Leung, 2022). Rather than discussing gig economy careers abstractly, ACLE enabled students to experience selected demands associated with such careers before entering actual employment environments.

The results also reveal that adaptivity should not be understood merely as technological personalization. In this study, adaptivity was pedagogical. Students engaged with different career scenarios, tasks, and developmental priorities according to their interests, initial competencies, and intended career pathways. This approach allowed the same instructional framework to support students interested in freelancing, digital entrepreneurship, creative work, remote services, and other portfolio-based careers.

The novelty of the findings therefore lies not simply in demonstrating that career preparation improves readiness. More importantly, the study identifies an instructional mechanism through which such readiness can be developed:

Explore → Adapt → Build → Simulate → Reflect

The sequence illustrates how learners can move progressively from understanding changing career environments to constructing adaptive resources, developing professional competencies, applying them in authentic situations, and reflecting on future career strategies. From an instructional design perspective, this finding supports the principle that learning outcomes emerge from the alignment of learner needs, objectives, activities, authentic tasks, assessment, and feedback. The iterative development and refinement of ACLE also reflects the logic of Educational Design Research, in which educational interventions are progressively improved through analysis, design, implementation, evaluation, and reflection (Choto & Ramadan, 2026).

The study consequently challenges the assumption that preparing Generation Z for emerging labor markets requires only the modernization of career counseling content. Simply adding information about freelancing or digital entrepreneurship to conventional counseling may be insufficient. The deeper requirement is to redesign how career learning occurs. Students need

opportunities to experience uncertainty, make career decisions, construct professional identities, test strategies, respond to realistic challenges, and learn from feedback.

These findings have practical implications for higher education institutions in Aceh and similar contexts. Career preparation programs should move beyond seminars, career information sessions, and employment-placement activities toward structured learning experiences that integrate digital career competence, entrepreneurial thinking, adaptability, authentic professional tasks, and reflective career management. Career counselors, educators, and instructional designers can therefore function collaboratively rather than independently in preparing students for changing employment environments.

Overall, the study demonstrates that ACLE bridges the gap between knowing about future careers and learning how to navigate them. Its primary contribution lies in reconceptualizing career preparation as an adaptive instructional process rather than an episodic counseling activity. By integrating exploration, authentic practice, personalization, feedback, and reflection, the model provides a more responsive approach to developing Generation Z's capacity to navigate flexible, non-linear, and digitally mediated careers in the gig economy. Visualization of research results Figure 1.

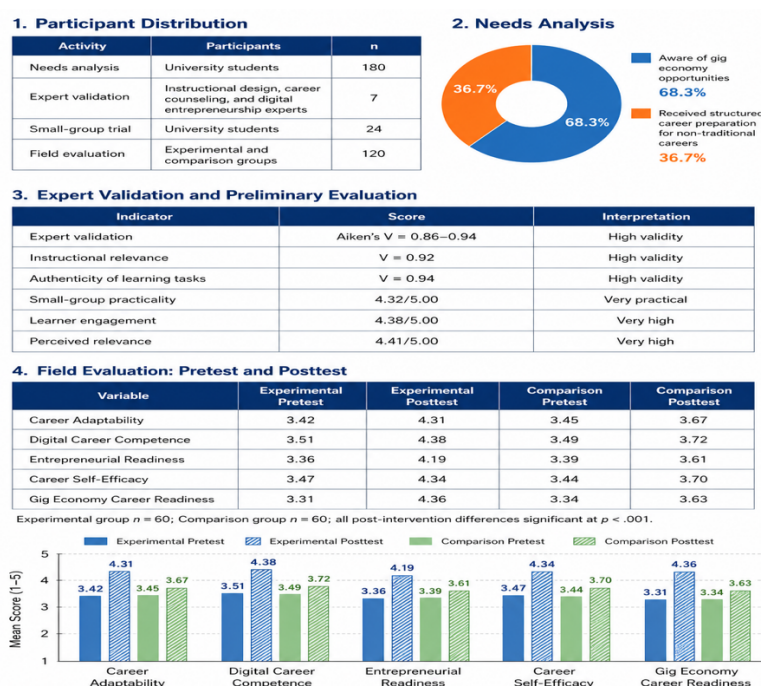


Figure 1. Visualization of research results

CONCLUSION

This study demonstrates that the Adaptive Career Learning Experience (ACLE) effectively strengthens Generation Z's readiness to participate in the gig economy. The integration of Explore, Adapt, Build, Simulate, and Reflect provides a structured learning pathway that enhances career adaptability, digital career competency, entrepreneurial readiness, career self-efficacy, and career readiness in the gig economy. These findings suggest that career preparation must go beyond conventional counseling to adaptive, authentic, and experiential learning. This study provides a learning design framework that can support higher education institutions in preparing students for an increasingly flexible, digital, and non-linear career environment.

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AUTHORING TOOL USE STATEMENT

During the preparation of this manuscript, the authors used ChatGPT (OpenAI) to assist with language refinement, sentence restructuring, and to improve the clarity and coherence of the manuscript. This AI tool was not used to generate or create the research data, results, or references

AUTHORS' CONTRIBUTION

Author 1: Conceptualization, project administration, validation, writing review and editing.

Author 2: Formal analysis, methodology, writing original draft.

Author 3: Data curation, investigation, Supervision, validation.

ETHICAL STANDARDS

This study was conducted in accordance with established ethical standards and principles for educational research. Participation was voluntary, and all participants were informed of the study's purpose, procedures, confidentiality, and data use prior to their participation. Informed consent was obtained from all participants, and their identities were anonymized to protect privacy and confidentiality.

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