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Responsible Job-Crafting Knowledge as a Foundation for Employability Competencies in Manufacturing

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ABSTRACT

Purpose of the study: This study examined whether a brief responsible job-crafting development program could strengthen manufacturing employees' knowledge of proactive work adjustment, organizational boundaries, and culturally aligned action as a foundation for employability competencies.

Methodology: A one-group pretest-posttest design involved 20 cross-functional employees in a six-hour face-to-face program; 17 matched cases were analyzed. Activities included concise instruction, manufacturing scenarios, collaborative problem solving, reflection, feedback, and action planning. Twelve-item knowledge accuracy was summarized descriptively and tested using the Wilcoxon signed-rank. Test.

Main findings: Mean accuracy increased from 2.4% (SD = 4.9) to 81.9% (SD = 13.0), a gain of 79.5 percentage points. Every matched participant improved (W = 0, exact $p < .001$; rank-biserial correlation = 1.00). The result represents immediate knowledge gain and not demonstrated behavioral transfer.

Novelty/originality of this study: The study conceptualizes responsible job-crafting knowledge as a cognitive foundation for employability competencies. It shows how entrepreneurship, accountability, and collaboration can be translated into decision criteria that balance individual initiative with safety, quality, coordination, and organizational boundaries.

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1. INTRODUCTION

Rapid technological, organizational, and market changes require employees to continue developing foundational employability competencies after formal education. These competencies include reflective problem solving, responsible initiative, accountability, collaboration, and the capacity to adapt work methods without compromising shared standards[1]-[3]. Contemporary employability research treats this capacity as multidimensional, combining occupational expertise, adaptability, career competencies, identity, social capital, and continued workplace learning [4]-[6]. In manufacturing, such competencies are especially important because employee initiative must remain aligned with safety, quality, standard operating procedures, and cross-functional coordination. Recent scholarship further emphasizes that employability is dynamic, career-long, and context-dependent, developing through interactions between individual agency and organizational conditions.

A foundational-competency perspective extends basic education beyond mastery of school subjects. Across the life span, adults continue to refine transferable capacities that support participation in work and society, including communication, self-direction, collaborative problem solving, and learning from experience [7]–[9]. Short, structured development programs can support these capacities when they connect concepts with authentic decisions, require participants to justify choices, and provide opportunities for feedback and reflection. The relevant educational question is thus not merely whether employees attend training, but whether they develop the conceptual discrimination needed to act responsibly in complex work settings.

Job crafting provides a useful framework for operationalizing these transferable capacities. It refers to self-initiated adjustments in tasks, relationships, or cognitions that influence how employees experience and perform their work [10], [11]. Within the Job Demands–Resources perspective, employees may increase structural and social resources, seek constructive challenges, or manage hindering demands [12], [13]. Research links approach-oriented job crafting with engagement, meaningfulness, performance, and well-being [14]–[18]. Yet proactive adjustment in tightly coupled manufacturing systems cannot mean unrestricted discretion. It must remain aligned with authority, operating procedures, safety standards, quality requirements, and affected coworkers [19]. Responsible job-crafting knowledge therefore involves recognizing both opportunities for initiative and the organizational boundaries that make an initiative constructive.

Previous job-crafting studies have primarily examined job crafting as an employee behavior or as an intervention outcome associated with occupational well-being and performance [20]–[21]. Training research, meanwhile, emphasizes instructional design, practice, feedback, and transfer conditions [22]–[26]. Meta-analytic and quasi-experimental evidence suggests that job-crafting interventions generally produce favorable but heterogeneous outcomes whose magnitude depends on the form of crafting, contextual support, and transfer conditions [27]–[29]. Less attention has been directed to a more foundational prerequisite: whether employees can accurately recognize responsible job crafting before attempting it. This distinction matters because behavior cannot be evaluated or transferred consistently when its defining criteria remain unclear.

The partner organization was strengthening an Achievers Culture expressed through entrepreneurship, accountability, and collaboration. A needs assessment indicated that these values required clearer translation into day-to-day behavior. Entrepreneurship was framed as evidence-informed improvement rather than unrestrained initiative; accountability as ownership of processes, results, learning, and work boundaries; and collaboration as information sharing, mutual support, coordination, and recognition of interdependent contributions. Responsible job crafting was used as the behavioral bridge between these cultural expectations and employees' transferable employability competencies.

Accordingly, this study asked: To what extent does a six-hour responsible job-crafting development program improve manufacturing employees' knowledge of job-crafting forms, organizational boundaries, and culturally aligned applications? The study contributes by positioning responsible job-crafting knowledge as a foundation for employability competencies, specifying a context-sensitive intervention sequence, and reporting immediate matched outcomes with explicit limits. It differs from the related ISEJ manuscript, which centers on workplace-learning processes and experiential pedagogy, and from the JACS manuscript, which centers on community-service implementation, partnership, and applied outputs.

2. Conceptual Basis and Competency Framework

2.1. Foundational Employability Competencies Across the Life Span

Foundational competencies are transferable capacities that enable individuals to learn, participate, solve problems, and adapt across settings. Their development does not end with compulsory or higher education; work provides a continuing context in which adults refine judgment, self-direction, communication, and collaboration [30]–[32]. In organizational settings, these competencies become visible through how employees interpret ambiguous situations, seek information, coordinate with others, and evaluate the consequences of proposed action. Structured reflection and feedback can make tacit assumptions visible and support more deliberate workplace decisions [33]–[34].

The program organized competency development into four linked phases: orientation, exploration, action, and commitment. Orientation clarified the cultural expectations and activated prior experience. Exploration introduced job-crafting concepts and required participants to distinguish constructive from inappropriate examples. Action involved mapping resources, demands, stakeholders, constraints, and indicators of success. Commitment translated understanding into a bounded workplace experiment. Although the activities used experiential methods, the focal construct in this article is the resulting foundational knowledge needed for responsible initiative, accountability, and collaboration.

2.2. Responsible Job Crafting as a Competency Foundation

In this study, responsible job-crafting knowledge denotes the ability to identify job-crafting forms, judge their appropriateness, and connect them to feasible action within organizational boundaries. It is treated as a cognitive foundation for employability competencies rather than as proof of actual job-crafting behavior. This distinction follows training-evaluation logic: knowledge is a proximal outcome, whereas transfer, sustained behavior, and organizational results require later observation [35], [36].

The content emphasized four resource-and-demand strategies [12]: increasing structural resources, increasing social resources, seeking challenging demands, and reducing hindering demands. Each proposed action was evaluated against four safeguards: consistency with standard operating procedures, protection of safety,

contribution to quality or performance targets, and coordination with the relevant leader or team. This bounded formulation connects personal initiative with accountability and collaboration, reducing the risk that job crafting is misread as permission for unilateral role or process changes.

3. RESEARCH METHOD

3.1. Design, Setting, and Participants

A one-group pretest-posttest pre-experimental design evaluated immediate learning. The intervention was conducted face to face on 29 July 2026 at an automotive manufacturing company in Indonesia. Twenty employees from different functions and position levels attended the six-hour program (09:00–15:00 Western Indonesian Time). Participation in the workshop followed the organization's internal nomination process. Seventeen participants had identifiable and complete pretest-posttest data and formed the matched analytic sample.

3.2. Intervention Procedure

Before implementation, the university team and the human-resources partner conducted a needs assessment, aligned examples with the three cultural values, developed manufacturing scenarios, and prepared a facilitator guide and action-planning worksheet. The six-hour program used concise explanation followed by scenario classification, group problem solving, reflection, feedback, and individual action planning. Participants completed the pretest, examined job-crafting forms and boundaries, evaluated culturally relevant cases, presented their reasoning, prepared a responsible workplace action, and completed the posttest. Selected implementation activities are documented in Figure 1.



Figure 1. Facilitated activity and participant engagement during the program.

The sequencing of instruction, practice, feedback, and action planning followed established training-design principles [30].

Table 1. Responsible job-crafting competency-development sequence

Phase	Competency-development activity	Targeted capacity	Expected evidence
Orientation	Cultural expectations, baseline test, and activation of prior experience	Relevance and self-awareness	Initial conceptions
Exploration	Brief input, behavior cards, authentic cases, and group justification	Conceptual discrimination and collaborative judgment	Accurate classification and rationale
Action	Mapping resources, demands, safeguards, stakeholders, and success indicators	Responsible problem solving	Feasible and bounded action plan
Commitment	Reflection, written commitment, and posttest	Accountability and readiness for transfer	Immediate knowledge and next-step commitment

3.3. Measure and Data Analysis

The 12-item assessment addressed Achievers Culture, employee well-being, job-crafting dimensions, scenario interpretation, and safe application. The exported platform record reported the percentage of correctly answered questions. Data were matched using participant identifiers. Three pretest-only records and one posttest-only record were excluded from paired analysis. Descriptive statistics included the mean, standard deviation, median, and percentage-point gain. Because the pretest distribution showed a severe floor effect and non-normality (Shapiro–Wilk $W = .564$, $p < .001$), the Wilcoxon signed-rank test was selected. Statistical significance was evaluated at $\alpha = .05$; rank-biserial correlation summarized effect magnitude. The outcome represents immediate

knowledge accuracy, not employability performance, sustained behavior, safety, or well-being. The signed-rank procedure follows Wilcoxon's paired-ranking method [37].

3.4. Ethical Considerations

Participants were informed of the educational and evaluation purposes of the activity, participation was voluntary, and reporting used aggregated data without identifying individual employees. The analysis used de-identified matched records. No personnel decision was based on the scores.

4. RESULTS AND DISCUSSION

4.1. Immediate Responsible Job-Crafting Knowledge

All 17 matched participants recorded higher posttest accuracy than pretest accuracy. Mean accuracy rose from 2.4% (SD = 4.9) to 81.9% (SD = 13.0), representing a gain of 79.5 percentage points. The median increased from 0% to 83%. Table 2 summarizes the immediate knowledge outcome.

Table 2. Matched pretest-posttest responsible job-crafting knowledge accuracy

Measurement	n	Mean (%)	SD	Median (%)
Pretest	17	2.4	4.9	0
Posttest	17	81.9	13.0	83
Gain	17	79.5	—	83

The Wilcoxon signed-rank test indicated a statistically significant difference, $W = 0$, exact $p < .001$. All non-zero ranks were positive (sum of positive ranks = 153; negative ranks = 0), producing a rank-biserial correlation of 1.00. This value describes complete directional consistency in this small matched sample; it should not be interpreted as a population-level causal estimate.

4.2. From Cultural Values to Foundational Competencies

The immediate gain suggests that abstract cultural values can be made more cognitively accessible when they are linked with decision rules and recognizable workplace cases. Participants did not merely recall the labels entrepreneurship, accountability, and collaboration; they evaluated whether proposed actions demonstrated evidence-informed improvement, ownership of consequences, and coordination with affected stakeholders. This knowledge-level result is consistent with the broader view that employability develops through an interaction of competencies, adaptability, identity, and workplace learning rather than through technical knowledge alone [38].

The group cases highlighted the interdependence of manufacturing work. Employees encountered alternative interpretations from other functions and considered downstream consequences. An apparently helpful individual adjustment could create a safety, quality, or coordination problem elsewhere. By making standard operating procedures, safety, targets, and stakeholder coordination explicit decision criteria, the program embedded organizational responsibility within the meaning of proactivity. This extends job-crafting research by foregrounding the boundary conditions under which self-initiated change supports, rather than disrupts, collective performance [39].

Action planning provided a prospective bridge from knowledge to application. Each participant identified a proposed adjustment, relevant stakeholders, necessary support, organizational safeguards, and evidence of success. Training-transfer research indicates, however, that knowledge and intention alone do not guarantee changed behavior; opportunity, supervisor support, feedback, and follow-up remain important [40]–[42]. Job-crafting intervention evidence likewise indicates that sustained outcomes depend on contextual conditions and how crafting is enacted [43]-[45]. Recent intervention and synthesis studies show that effects depend on workload, participant engagement, organizational-change conditions, and the job characteristics being modified, reinforcing the need for supervised follow-up and context-sensitive implementation [46]-[49].

4.3. Contribution to Basic and Life-Span Education Research

The study contributes to JBER's life-span and cross-sector education scope by examining how foundational competencies continue to develop among adults in a non-formal organizational setting. Here, foundational does not refer to an elementary grade level; it refers to transferable capacities supporting learning, participation, responsible initiative, reflective judgment, and collaboration. The article consequently complements school-based basic-education research by showing how these capacities are refined when adults confront authentic, interdependent problems. Its contribution is bounded to adult workforce development and should not be generalized to early-childhood, primary, or secondary learners.

The results require conservative interpretation. First, the design lacked a control group, random assignment, and delayed measurement. Testing effects, facilitation, novelty, or other contemporaneous influences cannot be separated from the intervention. Second, the matched sample was small and organizationally specific. Third, pretest scores were dominated by zero values. This floor effect may reflect limited prior knowledge, insufficient response time, platform unfamiliarity, or technical constraints and likely inflated the apparent gain. Fourth, the measure captured accuracy on workshop-aligned questions; evidence of reliability, item equivalence, and external validity was not available. Fifth, no behavioral, performance, safety, or well-being outcome was measured.

Future studies should pilot parallel assessment forms, report item-level validity and reliability, provide platform orientation, and include a comparison group with delayed follow-up. Evaluation should combine knowledge tests with rated scenario explanations, supervisor observations, completion of responsible job-crafting plans, and validated measures of job crafting, collaboration, employability, and work outcomes. Multilevel studies could test whether team learning climate, supervisor support, and safety climate condition the transfer of foundational knowledge into behavior. Such designs would also clarify whether employability-related well-being and organizational outcomes develop together or involve trade-offs. Instrument refinement should follow established scale-development and validation procedures.

CONCLUSION

A six-hour responsible job-crafting development program was associated with a large and directionally consistent immediate increase in knowledge accuracy among 17 matched manufacturing employees. The contribution lies in connecting entrepreneurship, accountability, and collaboration with explicit criteria for safe, coordinated, and evidence-informed action. Responsible job-crafting knowledge can therefore be treated as a cognitive foundation for employability competencies developed across the life span. Because the study used a small one-group design and measured only immediate knowledge, conclusions about sustained behavior, performance, safety, or employee well-being require controlled and longitudinal evaluation. Recommendations: Organizations should combine responsible job-crafting training with supervisor coaching, scheduled reviews of action plans, and safeguards that verify alignment with standard operating procedures, safety, quality, and coordination requirements. Future evaluations should use validated parallel-form measures, a comparison group, and follow-up assessments of behavior, performance, safety, and well-being. Replication across organizations, occupations, and employee groups is recommended before broader generalization.

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AUTHOR CONTRIBUTIONS

Conceptualization, L.Y., A.S., and G.G.; methodology, L.Y., K.W.P., and D.F.; validation, G.G., K.W.P., and L.Y.W.; formal analysis, L.Y. and H.A.K.; investigation, all authors; resources, A.S. and L.Y.; data curation, H.A.K., R.A., and S.A.R.; writing—original draft preparation, L.Y.; writing—review and editing, G.G., K.W.P., L.Y.W., and D.F.; visualization, R.A. and S.A.R.; supervision, L.Y. and G.G.; project administration, L.Y., H.A.K., R.A., and S.A.R.; funding acquisition, L.Y.

INFORMED CONSENT STATEMENT

Informed consent was obtained from participants involved in the evaluation. Participation was voluntary, and results are reported only in aggregate form.

CONFLICTS OF INTEREST

The authors declare no conflict of interest. The organizational partner contributed to contextual needs assessment and implementation but did not determine the statistical interpretation or the decision to publish.

USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

During manuscript preparation, the authors used Gemini AI to support language editing, structural organization, and consistency checking. The authors reviewed and revised all content, verified the analysis and references, and take full responsibility for the published work.

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