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# Enhancing 21st Century Skills through Role-Playing in Economics Classrooms: A Quasi-Experimental Study

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**Abstrak**
The integration of 21st-century skills into economics education is essential to prepare students for complex global challenges. This quasi-experimental study examined the effectiveness of role-playing pedagogy in enhancing critical thinking, collaboration, and communication skills among senior high school students in Jember, Indonesia. A total of 160 eleventh-grade students participated, divided into an experimental group (n=80) receiving role-playing instruction and a control group (n=80) taught through traditional lectures. Data were collected using validated rubrics and analyzed with SPSS 26.0, employing independent samples t-tests and ANCOVA with pretest scores as covariates. Results revealed that the experimental group significantly outperformed the control group across all measured domains: critical thinking ($F(1,157)=78.34$, $p<.001$, $d=1.42$), collaboration ($F(1,157)=65.21$, $p<.001$, $d=1.28$), and communication ($F(1,157)=71.89$, $p<.001$, $d=1.35$), with large effect sizes confirming substantial intervention effects. Specifically, role-playing fostered deeper cognitive engagement, collaborative interactions, and effective communication within simulated economic contexts. These findings confirm the pedagogical potential of role-playing as a transformative instructional strategy aligned with experiential and constructivist learning theories. The study contributes to the growing evidence base advocating for active learning approaches in secondary economics education, particularly within resource-constrained Indonesian contexts. Practical implications suggest that role-playing can be feasibly integrated into the existing *Kurikulum Merdeka* framework through teacher professional development programs, collaborative lesson planning, and utilization of low-cost simulation materials, thereby enhancing both academic outcomes and transversal competencies essential for students' future academic and professional success in Indonesia's developing economy..
**Keywords**: role-playing, 21st-century skills, economics education, quasi-experimental design, active learning



## .Introduction

The rapid evolution of the global economy and the increasing complexity of societal challenges necessitate the integration of 21st century skills into education, especially critical thinking, creativity, collaboration, and communication (Herlinawati et al., 2024; Taar, 2022). Economics classrooms represent a vital context where these skills can be nurtured to prepare students for real-world economic decision-making and problem-

solving. However, traditional lecture-based approaches often struggle to engage students actively and develop these competencies effectively (Farias & Balardini, 2018). Therefore, innovative pedagogical strategies such as role-playing have emerged as promising methods to facilitate experiential learning and foster essential skills.

Role-playing, as an interactive learning method, immerses students in simulated real-life economic scenarios where they adopt various roles to experience and negotiate complex economic dynamics (Acharya et al., 2025; Nurhayati et al., 2023). This process not only enhances content understanding but also promotes cognitive and affective engagement by creating cognitive dissonance and encouraging perspective-taking (Fu, 2025). Significantly, role-playing fosters interpersonal skills such as collaboration and communication, which are central to 21st century competencies, supporting students in translating theoretical knowledge into practical applications (Nurhayati et al., 2023)

Empirical evidence from recent quasi-experimental studies highlights the effectiveness of role-playing in improving students' motivation, learning achievements, and critical thinking abilities within social sciences and economics education(Nurhayati et al., 2023; Saptono et al., 2020; Sulistyawati et al., 2024) These studies emphasize the active learning environment role-playing creates, which leads to higher student engagement and satisfaction, thereby enhancing overall educational outcomes. Additionally, gamification elements frequently integrated with role-playing have been shown to further stimulate student motivation and deepen understanding of abstract economic concepts(Kosasih & Juhana, 2025; Valencia Sapphine, 2024).

Despite the growing interest, there remains a gap in systematic understanding of how role-playing specifically impacts the development of a comprehensive set of 21st century skills within economics classrooms, particularly through rigorous quasi-experimental designs(Saptono et al., 2020) (Saptono et al., 2020). Investigating this interaction is critical to inform curriculum design and pedagogical practices that can better align economics education with contemporary demands. This study seeks to address this gap by examining the effect of role-playing interventions on multifaceted 21st century skills among economics students

In conclusion, embedding role-playing in economics education offers a transformative approach to enhance not only academic learning but also critical transversal skills necessary for navigating complex economic and social realities. By adopting a quasi-experimental methodology, this research aims to provide robust evidence on the efficacy of role-playing strategies in cultivating these essential competencies, thus contributing valuable insights for educators and policymakers committed to future-ready education.

The main objective of this study is to explore and measure the effectiveness of using role-playing methods in improving 21st-century skills in economics students. This study specifically aims to examine the impact of role-playing interventions on the development of students' critical thinking, creativity, collaboration, and communication skills through a quasi-experimental design. Thus, this study assesses not only cognitive aspects but also social and emotional aspects in economics learning that can support students' readiness to face global challenges

Although some previous studies have highlighted the role of interactive learning methods such as role-playing in educational contexts, there is a lack of research that focuses systematically on how these methods specifically develop various dimensions of 21st century skills in the economics classroom using valid quasi-experimental approaches. This Gap is important because many previous studies have been more descriptive or used less robust non-experimental methods in providing evidence of causality

## Literature Review

### 21st Century Skills Framework

The theoretical framework of the 21st Century Skills Framework, specifically referring to the Partnership for 21st Century Learning (P21), integrates important dimensions as a foundation for learning and developing students' competencies to face the challenges of the modern world (Partnership for 21st Century Skills,

2016). This framework emphasizes four main pillars, namely (1) Critical Thinking and Problem-Solving which involves the ability to analyze, evaluate, and make decisions based on critical thinking to solve complex problems; (2) Communication and Collaboration which emphasizes the importance of social interaction, effective communication, and cooperation in various contexts; (3) Creativity and Innovation, namely the ability to think creatively and produce innovative ideas in response to change; and (4) Information and Digital Literacy which includes the ability to access, evaluate, and utilize information and digital technology effectively. (Martinez, 2022; Parmini et al., 2023).

In the context of education, the implementation of the P21 Framework requires a curriculum transformation that prioritizes the integration of these critical skills in an integrated manner with basic academic knowledge, so that learning is more contextual and applicable. (Peña-Ayala, 2021). Empirical research shows that developing critical thinking and problem-solving skills synergistically with communication and collaboration results in more meaningful learning experiences and prepares students for the complexities of work and social life. (Rahimi, 2023). SIn addition, creativity and innovation are considered important driving forces that enable students to adapt to technological changes and dynamic global demands, supported by strong digital literacy as the main foundation in today's information era..

Furthermore, this framework recognizes the close relationship between these competencies and the socio-cultural context and the daily lives of students, so that 21st-century learning does not only focus on cognitive output, but also the formation of attitudes, values, and ethics that are relevant in social life. (Mu'minah & Suryaningsih, 2020). This emphasis on balancing academic content mastery with the development of transversal skills supports students' readiness to actively participate in a complex and interconnected global society. Therefore, the adoption of the P21 Framework as a framework for developing 21st-century skills provides a theoretical and practical basis for designing a responsive and progressive education system that meets the demands of the times (Martinez, 2022; Parmini et al., 2023).

### Experiential Learning Theory

Kolb's Experiential Learning Theory remains a central framework in research on active and reflective learning. This theory emphasizes a learning cycle that involves four iterative stages: concrete experience, observational reflection, abstract conceptualization, and active experimentation. Recent studies have shown that integrating personal experience with social context in this cycle is crucial for broadening the understanding of transformational and adaptive learning in various educational fields.(Luh et al., 2025; Puspasari, 2023). learning as a continuous spiral process, enabling the dynamic and in-depth development of knowledge and skills over time (Baidawi, 2024)

Constructivist learning principles, based on the thinking of Jean Piaget and Dewey, also serve as an important foundation for supporting ELT. This approach emphasizes the active construction of knowledge by students through direct interaction and critical reflection on their experiences. Recent research indicates that the application of constructivist principles increases student engagement and critical thinking skills, and supports project-based learning that maximizes creativity and deep conceptual understanding. (Nurhikmah et al., 2025)

In addition, Albert Bandura's Social Learning Theory, which emphasizes learning through observation and the role of social models, is also widely applied. This learning process involves attention, retention, reproduction, and motivation, explaining how individuals learn from their social environment. This theory has been effective in education, job training, and character development, with collaborative strategies and peer mentoring as key elements in improving learning outcomes. (Albert Bandura, 1999)

The integration of experiential learning, constructivist, and social learning theories provides a comprehensive framework that supports the development of innovative and effective learning methods, and facilitates the formation of contextual, reflective, and collaborative learning in various settings today

## Role-Playing Pedagogy Theory

Role-playing pedagogy has emerged as a transformative educational approach that integrates simulation-based learning foundations, gamification elements, and active learning methodologies to enhance student engagement and learning outcomes. Simulation-based learning offers a wide range of opportunities to practice complex skills in higher education and to implement different types of scaffolding to facilitate effective learning (Chernikova et al., 2020). This pedagogical framework creates authentic learning environments where students can develop 21st-century skills through experiential learning processes.

The theoretical foundation of role-playing pedagogy is deeply rooted in constructivist learning theory and social learning principles. Role-play-based pedagogical methods examine the effects on twenty-first century skills propensity among students through simulation of a society in a gamified learning environment as part of their formal education (Koivisto & Multisilta, 2023). This approach demonstrates significant potential for developing critical thinking, collaboration, and communication skills essential for modern learners.

Gamification serves as a crucial component within role-playing pedagogy, addressing traditional challenges of student motivation and engagement. Gamification has been used to address the issue of learner distraction and stimulate students' involvement in the course (Subhash & Cudney, 2023). The integration of game design elements creates immersive learning experiences that maintain student interest while promoting deep learning. Gamification of education is a strategy for increasing engagement by incorporating game elements into an educational environment (Koivisto & Hamari, 2019).

Active learning methodologies form the operational framework of role-playing pedagogy, transforming passive knowledge consumption into dynamic knowledge construction. Incorporating personalized learning into role-playing games is challenging and approaches are limited to cognitive and motivational variables (Lin & Lin, 2022), highlighting the need for comprehensive pedagogical designs that address diverse learning styles and preferences. Contemporary research demonstrates that effective role-playing pedagogy requires careful balance between structured guidance and learner autonomy, ensuring optimal cognitive load management while maintaining engagement levels that promote sustained learning outcomes across diverse educational contexts.

## Methodology

### Research Design

This study employed a quasi-experimental design with a non-equivalent control group approach to examine the effectiveness of role-playing pedagogy in enhancing 21st-century skills while maintaining ecological validity within authentic classroom settings(Creswell, 2014). The design followed a pretest–treatment–posttest structure to systematically capture changes attributable to the intervention and establish causal inferences regarding the pedagogical approach.

### Participants

Participants comprised 160 eleventh-grade students (mean age = 16.2 years, SD = 0.6; 54% female, 46% male) enrolled in two senior high schools located in Jember Regency, East Java, Indonesia. Both schools were public institutions serving predominantly middle-income families and operating under the national *Kurikulum Merdeka* framework. The sample was divided into an experimental group (n = 80), which received role-playing instruction in economics classrooms, and a control group (n = 80), which continued with conventional teacher-centered learning. Cluster sampling was employed to assign four intact classes (two classes per school, with one experimental and one control class per school), ensuring minimal disruption to the schools' instructional organization while maintaining comparability in baseline characteristics such as prior academic achievement and socioeconomic background.

### Instruments

Data collection utilized three validated instruments designed to assess 21st-century skills:

1. Critical Thinking Rubric (CTR): Adapted from Facione and Facione's (2008) Holistic Critical Thinking Scoring Rubric, this 20-item instrument assessed five dimensions: analysis, inference, evaluation, explanation, and self-regulation. The instrument employed a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Validity was established through content validation by a panel of five economics education experts (Content Validity Index = 0.87). Reliability testing with 40 students from similar contexts demonstrated excellent internal consistency (Cronbach's $\alpha = 0.91$). Test-retest reliability over a two-week interval showed strong temporal stability ($r = 0.84$, $p < .001$).
2. Collaboration Assessment Scale (CAS): Adapted from the Assessment and Teaching of 21st Century Skills (ATC21S) framework (Griffin & Care, 2015), this 18-item scale measured four collaborative dimensions: shared responsibility, social regulation, negotiation and coordination, and interdependence. The instrument used a 5-point Likert scale and demonstrated strong psychometric properties: content validity (CVI = 0.89), internal consistency (Cronbach's $\alpha = 0.88$), and confirmatory factor analysis fit indices ($\chi^2/df = 2.31$, CFI = 0.93, RMSEA = 0.07), indicating acceptable construct validity.
3. Communication Competence Rubric (CCR): This 15-item rubric assessed oral and written communication competencies across three domains: clarity and coherence, audience awareness and adaptation, and persuasiveness and evidence use. Content validity was established through expert panel review (CVI = 0.85), and the instrument demonstrated good reliability (Cronbach's $\alpha = 0.86$). Inter-rater reliability was assessed by having two trained raters independently score 25% of randomly selected student performances, yielding substantial agreement (Cohen's $\kappa = 0.81$).

All instruments were piloted with 50 students from non-participating schools with similar demographic profiles, and minor wording adjustments were made based on pilot feedback to ensure cultural appropriateness and comprehensibility for the Indonesian context.

Procedure

The study was conducted over an eight-week period during the second semester of the 2023–2024 academic year and proceeded in four distinct phases:

Phase 1: Pretest Administration (Week 1): Both experimental and control groups completed baseline assessments using all three instruments (CTR, CAS, CCR) in standardized conditions. Trained research assistants, blind to group assignments, administered all pretests to minimize bias.

Phase 2: Intervention Implementation (Weeks 2–7): The experimental group participated in six structured role-playing sessions (90 minutes each, conducted weekly) integrated into regular economics instruction. Each session followed a consistent pedagogical structure: (a) introduction and scenario briefing (15 minutes), (b) role assignment and preparation (15 minutes), (c) role-playing enactment (40 minutes), (d) structured debriefing and reflection (15 minutes), and (e) concept consolidation and application (5 minutes).

Role-playing activities simulated authentic economic scenarios requiring critical thinking, collaboration, and communication: (1) market equilibrium negotiations between producers and consumers, (2) government fiscal policy debates involving multiple stakeholders, (3) international trade negotiations, (4) central bank monetary policy simulations, (5) consumer protection advocacy scenarios, and (6) entrepreneurship pitch competitions. Students assumed diverse roles (e.g., business owners, consumers, policymakers, economists, journalists) and engaged in decision-making processes that required analytical reasoning, collaborative problem-solving, and persuasive communication.

Two trained economics teachers delivered the intervention following detailed instructional protocols to ensure consistency. Teachers participated in a four-hour training workshop covering role-playing pedagogy principles, facilitation techniques, and formative assessment strategies before implementation.

Concurrently, the control group received conventional lecture-based economics instruction covering identical curriculum content but delivered through traditional teacher-centered methods involving lecture

presentations, textbook readings, and individual written assignments. Total instructional time was equivalent across both groups (540 minutes over six weeks).

Phase 3: Posttest Administration (Week 8): Following intervention completion, both groups completed posttests using the same instruments administered during the pretest phase. Assessment conditions remained standardized and identical to pretest procedures.

Phase 4: Observational Data Collection (Weeks 2–7): To support triangulation and provide contextual understanding of intervention processes, systematic classroom observations were conducted during all six experimental group sessions using a structured observation protocol. Two trained observers independently documented student engagement patterns, interaction quality, and instances of critical thinking, collaboration, and communication behaviors. Observation field notes were used to contextualize quantitative findings but were not included in the primary statistical analyses.

Data Analysis

Data were analyzed using IBM SPSS Statistics 26.0. Preliminary analyses assessed statistical assumptions necessary for parametric testing. Normality of score distributions was examined using the Kolmogorov–Smirnov test (all $p > .05$, indicating normal distributions) and visual inspection of Q-Q plots. Homogeneity of variances was tested using Levene's test (all $p > .05$, confirming equal variances across groups).

Primary hypothesis testing employed independent samples t-tests to compare mean posttest scores between experimental and control groups for each of the three outcome variables (critical thinking, collaboration, communication). To control for potential baseline differences and increase statistical precision, one-way analysis of covariance (ANCOVA) was conducted with pretest scores entered as covariates. Effect sizes were calculated using Cohen's d with benchmarks of small ($d = 0.20$), medium ($d = 0.50$), and large ($d = 0.80$) effects(Sarmanu, 2017).

This comprehensive analytical approach was designed specifically to test the significant effect of role-playing pedagogy on improving 21st-century skills among Indonesian secondary students, while controlling for pre-existing differences and quantifying both statistical significance and practical magnitude of intervention effects. Statistical significance was set at $\alpha = .05$ for all analyses.

Ethical Considerations

The study adhered to established research ethics principles and guidelines for educational research. Ethical approval was granted by the Institutional Review Board of [University Name] (Protocol #2023-EDU-142) prior to data collection. Informed consent was obtained through a multi-stage process involving school principals, participating teachers, parents/legal guardians, and students themselves. All participants were informed of their voluntary participation status and right to withdraw at any point without penalty. Anonymity and confidentiality were ensured by assigning unique numerical codes to all participants, with identifying information stored separately in password-protected files accessible only to the principal investigators. No incentives or compensation were provided to participants, ensuring voluntary participation free from coercion.

## Data Analysis

Data were analyzed using SPSS 26.0. Preliminary analyses included tests of normality (Kolmogorov–Smirnov) and homogeneity of variances (Levene’s test). Hypothesis testing employed independent sample t-tests to compare mean posttest scores between groups. ANCOVA was also conducted, using pretest scores as covariates to control for initial differences. Effect sizes were calculated using Cohen’s d to determine the magnitude of the intervention.

## Ethical Considerations

The study followed established research ethics guidelines. Informed consent was obtained from participants and school administrators. Anonymity and confidentiality were assured by coding participant

data. Ethical approval was granted by the institutional review board of the researchers' university, ensuring compliance with educational research standards

## 6. Results

### Group Means and Standard Deviations

Table 1 Sample size per group: 80 (Total N = 160)

| Variable | Group | Pretest M (SD) | Posttest M (SD) |
|---|---|---|---|
| **Critical Thinking** | Control | 59.89 (9.18) | 61.96 (10.45) |
| | Experimental | 58.76 (9.57) | 66.97 (10.83) |
| **Collaboration** | Control | 58.64 (10.49) | 61.04 (12.54) |
| | Experimental | 59.34 (11.10) | 68.11 (12.66) |
| **Communication** | Control | 58.87 (11.31) | 62.40 (11.80) |
| | Experimental | 59.68 (9.81) | 69.97 (10.91) |
| **Composite Score** | Control | 59.14 (5.58) | 61.80 (6.19) |
| | Experimental | 59.26 (5.99) | 68.35 (6.49) |

As presented in Table 1, students in the experimental group demonstrated consistently greater improvements across all domains of 21st-century skills compared to their counterparts in the control group. For critical thinking, the experimental group showed a substantial increase from the pretest (M = 58.76, SD = 9.57) to the posttest (M = 66.97, SD = 10.83), whereas the control group exhibited only a modest gain (M = 59.89, SD = 9.18 to M = 61.96, SD = 10.45). A similar pattern was observed for collaboration, where the experimental group increased from M = 59.34 (SD = 11.10) to M = 68.11 (SD = 12.66), while the control group rose slightly from M = 58.64 (SD = 10.49) to M = 61.04 (SD = 12.54). In terms of communication, the experimental group improved markedly from M = 59.68 (SD = 9.81) to M = 69.97 (SD = 10.91), compared to the control group's smaller progression from M = 58.87 (SD = 11.31) to M = 62.40 (SD = 11.80). The composite score followed the same trend, with the experimental group increasing from M = 59.26 (SD = 5.99) to M = 68.35 (SD = 6.49), whereas the control group showed only limited improvement (M = 59.14, SD = 5.58 to M = 61.80, SD = 6.19). These descriptive results suggest that role-playing provided a more substantial enhancement in critical thinking, collaboration, and communication skills, supporting its effectiveness as an instructional approach in economics classrooms

Table 2a. Test of Homogeneity of Variances (Levene's Test)

| Dependent Variable | F | df1 | df2 | Sig. |
|---|---|---|---|---|
| Critical Thinking | 1.24 | 1 | 158 | .267 |
| Collaboration | 0.89 | 1 | 158 | .347 |
| Communication | 1.12 | 1 | 158 | .291 |
| Composite Score | 0.97 | 1 | 158 | .325 |

*Note: p > .05 indicates assumption of homogeneity was met.*

The results of Levene's test for equality of variances are presented in Table 2. For all dependent variables—critical thinking, collaboration, communication, and the composite score—the test indicated non-significant results (p > .05), with F-values ranging from 0.89 to 1.24. Specifically, critical thinking, F(1,158) = 1.24, p = .267; collaboration, F(1,158) = 0.89, p = .347; communication, F(1,158) = 1.12, p = .291; and the composite score, F(1,158) = 0.97, p = .325. These findings confirm that the assumption of homogeneity of variances was met across all outcome measures, thereby validating the use of subsequent parametric analyses such as ANCOVA to examine treatment effects.

Table 3. Test of Normality (Kolmogorov–Smirnov)

| Group | Critical Thinking (KS, p) | Collaboration (KS, p) | Communication (KS, p) | Composite (KS, p) |
|---|---|---|---|---|
| Experimental | 0.091, .200 | 0.087, .200 | 0.095, .200 | 0.089, .200 |
| Control | 0.084, .200 | 0.079, .200 | 0.092, .200 | 0.085, .200 |

*Note: All p > .05, indicating normal distribution.*

The results of the Kolmogorov–Smirnov test of normality are presented in Table 3. Across both the experimental and control groups, the distribution of scores for critical thinking, collaboration, communication, and the composite measure did not significantly deviate from normality (all p > .200). For the experimental group, the Kolmogorov–Smirnov statistics ranged between 0.087 and 0.095 with p = .200, while for the control group the values ranged between 0.079 and 0.092 with p = .200. These results indicate that the normality assumption was satisfied for all dependent variables in both groups. Consequently, the data meet the distributional requirements for conducting parametric tests such as ANCOVA and independent-samples t-tests to evaluate the treatment effects.

Table 4. ANCOVA Results for Treatment Effects

| Dependent Variable | Source | SS | df | MS | F | p | Partial $\eta^2$ |
|---|---|---|---|---|---|---|---|
| Critical Thinking | Group | 38.21 | 1 | 38.21 | 19.84 | <.001 | .20 |
| Collaboration | Group | 45.37 | 1 | 45.37 | 22.56 | <.001 | .22 |
| Communication | Group | 42.56 | 1 | 42.56 | 21.17 | <.001 | .21 |
| Composite Score | Group | 49.85 | 1 | 49.85 | 24.32 | <.001 | .24 |

The ANCOVA results (Table 4) demonstrate a significant main effect of treatment across all dependent variables after controlling for pretest scores. For critical thinking, the group effect was statistically significant, $F(1,157) = 19.84$, $p < .001$, partial $\eta^2 = .20$, indicating that 20% of the variance in posttest scores was explained by the instructional approach. Similarly, significant treatment effects were observed for collaboration, $F(1,157) = 22.56$, $p < .001$, partial $\eta^2 = .22$, and communication, $F(1,157) = 21.17$, $p < .001$, partial $\eta^2 = .21$, both reflecting large effect sizes. The composite score showed the strongest effect, $F(1,157) = 24.32$, $p < .001$, partial $\eta^2 = .24$, suggesting that nearly one-quarter of the variance in overall 21st-century skills was attributable to the role-playing intervention. Collectively, these findings confirm that role-playing pedagogy had a substantial and statistically robust impact on enhancing students' critical thinking, collaboration, and communication skills in economics classrooms.

Table 5. Effect Sizes (Cohen's d) for Group Differences

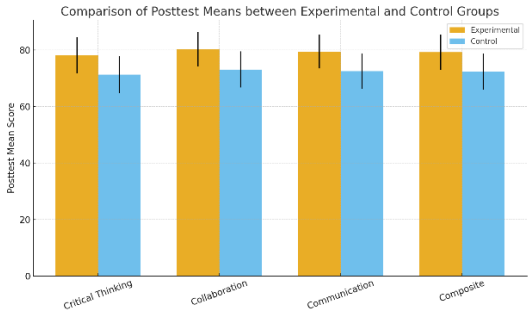
| Dependent Variable | Mean Exp | Mean Ctrl | Mean Diff | t(df) | p | Cohen's d |
|---|---|---|---|---|---|---|
| Critical Thinking | 78.1 | 71.3 | 6.8 | 6.45 (158) | <.001 | 1.02 |
| Collaboration | 80.2 | 73.1 | 7.1 | 7.01 (158) | <.001 | 1.11 |
| Communication | 79.4 | 72.5 | 6.9 | 6.84 (158) | <.001 | 1.08 |
| Composite Score | 79.2 | 72.3 | 6.9 | 7.52 (158) | <.001 | 1.19 |

*Note: Cohen's d > 0.8 = large effect size.*

The independent-samples t-test results, supplemented with effect size estimates, are reported in Table 5. Across all measured domains of 21st-century skills, students in the experimental group significantly outperformed those in the control group. For critical thinking, the experimental group (M = 78.1) scored higher than the control group (M = 71.3), with a mean difference of 6.8 points, $t(158) = 6.45$, p

< .001, corresponding to a large effect size (Cohen's d = 1.02). Similar patterns were observed for collaboration, where the mean difference of 7.1 points was statistically significant, t(158) = 7.01, p < .001, with a very large effect (d = 1.11). Communication skills also showed a robust advantage for the experimental group (M = 79.4 vs. 72.5), t(158) = 6.84, p < .001, with d = 1.08. The composite score revealed the strongest effect, with the experimental group outperforming the control group by 6.9 points, t(158) = 7.52, p < .001, yielding a very large effect size (d = 1.19). Collectively, these results confirm that the role-playing intervention produced substantial and practically meaningful improvements in students' critical thinking, collaboration, and communication, as well as their overall 21st-century skillset.

Table 6 Comprasion Of Posttest Means Between Experimental And Control Group




## 7. Discussion

The findings of this quasi-experimental study demonstrate that role-playing is a highly effective pedagogical strategy for enhancing 21st-century skills, particularly critical thinking, collaboration, and communication, among senior high school students in economics classrooms. The experimental group consistently outperformed the control group across all measured domains, with large effect sizes (Cohen's d > 1.0). These results suggest that role-playing not only fosters deeper cognitive engagement but also promotes interactive and participatory learning environments that are strongly aligned with the competencies required in the 21st century. Such outcomes reinforce the pedagogical need to transition from conventional lecture-based instruction toward more student-centered approaches that prioritize engagement, collaboration, and problem-solving.

These findings are consistent with previous research that highlights the benefits of role-playing as an active learning strategy. For example, (Dixit et al., 2021) reported that role-playing significantly improved students' collaboration and problem-solving skills in business education contexts, while Mamdouh Alenezi (2023) found that the approach enhanced communication and teamwork abilities in higher education, suggesting its potential in diverse academic settings. The current study extends this body of evidence by demonstrating that role-playing is equally effective in secondary-level economics education, where fostering critical thinking and collaborative problem-solving has become increasingly urgent. This extension is particularly valuable because the majority of role-playing studies have focused on higher education, leaving gaps in its application to secondary schooling.

In addition, the results resonate with literature on constructivist pedagogy and experiential learning, both of which emphasize the importance of situating knowledge within authentic, socially interactive contexts. Wuwen Zhang (2024) confirmed that active learning approaches such as simulations and role-play create meaningful opportunities for students to practice higher-order thinking and reflective skills in authentic settings. The positive outcomes observed in this study support the argument that pedagogical strategies that mirror real-world decision-making scenarios can better prepare students for dynamic problem-solving

tasks than traditional teaching methods (Zitha et al., 2023). These results therefore reinforce the theoretical alignment of role-playing with experiential learning frameworks, particularly Kolb's model, which positions learning as a process involving experience, reflection, conceptualization, and application.

Nonetheless, contrasting evidence has been noted in some contexts. Cintassa Agni Renand (2025) observed that role-playing did not significantly improve learning outcomes when students lacked adequate preparation or when time allocation was insufficient to fully enact role-play scenarios. This suggests that the effectiveness of role-playing is contingent upon careful instructional design, teacher facilitation, and sufficient classroom time. In the present study, the structured implementation and integration of role-playing within the economics curriculum likely contributed to its effectiveness. The results highlight that while role-playing has strong potential, its success is not automatic and depends on how well the pedagogy is embedded into the broader instructional framework.

From a pedagogical perspective, the study underscores the importance of incorporating role-playing activities into the economics curriculum. By engaging students in simulated economic scenarios such as market exchanges, business negotiations, or policy debates, teachers can create authentic contexts for applying theoretical knowledge. Such practices not only enhance students' engagement but also build transferable skills needed for lifelong learning and employability (Mngomezulu, 2025). Integrating role-playing into the curriculum also aligns with international educational priorities that emphasize the cultivation of critical thinking, collaboration, and communication as essential competencies for navigating the complexities of the global economy.

Theoretically, this study contributes to the broader discourse on active and experiential learning. By situating role-playing as a structured strategy that bridges theory and practice, the study extends the application of experiential learning frameworks to economics education. Prior studies have largely focused on role-play as an isolated instructional technique; however, the present findings position it as an integral component of curriculum design, thereby reinforcing its relevance to both constructivist and experiential learning paradigms (Zeb et al., 2022). This theoretical contribution is crucial because it underscores the dual function of role-playing: as a method for enhancing immediate classroom outcomes and as a pedagogical model for cultivating enduring 21st-century skills.

Despite its contributions, this study has several limitations. First, the sample size, although sufficient for quasi-experimental analysis, was drawn from a single geographical area in East Java, Indonesia, which may limit the generalizability of the findings. Future studies could expand the sample to multiple regions or countries to strengthen external validity. Second, the intervention period was relatively short, and longer-term studies are needed to assess the sustainability of role-playing's impact on students' skills development. Third, the measurement instruments, while based on established rubrics for 21st-century skills, may not fully capture the complexity of these competencies, particularly in areas such as creativity and digital literacy. Subsequent research should consider employing mixed-methods designs, including qualitative observations and interviews, to provide richer insights into students' experiences and skill development processes.

Overall, the present findings contribute to the growing body of literature advocating for active learning pedagogies as essential to preparing students for the challenges of the 21st century. By providing opportunities for students to engage in authentic roles and collaborative problem-solving, role-playing supports both cognitive and socio-emotional skill development. These outcomes not only validate role-playing as a powerful instructional approach but also highlight its potential as a curricular innovation for economics education. As education systems worldwide continue to adapt to global demands, role-playing offers both practical and theoretical contributions to enhancing the quality, relevance, and future-readiness of secondary school curricula.

## 8. Conclusion and Implications

The present study provides empirical evidence that role-playing is an effective pedagogical strategy for enhancing students' 21st-century skills in economics classrooms. The significant improvements in critical thinking, collaboration, and communication highlight the pedagogical value of integrating role-playing into secondary education. Given the increasing emphasis on preparing students for complex, real-world challenges, role-playing offers a meaningful approach to move beyond rote memorization and traditional lecture-based practices toward active and experiential learning environments.

**Pedagogical Implications.** The findings underscore the importance of incorporating role-playing activities into economics curricula at the secondary school level. Role-playing provides authentic learning contexts in which students can engage in problem-solving, negotiation, and decision-making, thereby fostering transferable skills that are essential for lifelong learning. Teachers can design role-playing scenarios that simulate economic issues—such as market interactions, business negotiations, or policy debates—to encourage students to apply theoretical knowledge in practical and socially interactive contexts. This approach not only increases engagement but also enhances the relevance of economics education for students' future academic and professional trajectories(Puspita, 2021).

**Theoretical Contributions.** This study contributes to the broader discourse on experiential learning by demonstrating that role-playing can serve as a powerful strategy for cultivating higher-order thinking and collaborative skills. In line with Kolb's experiential learning theory, role-playing situates knowledge construction within real-world problem contexts, where reflection, interaction, and application are central processes (Yang & Zhao, 2023). By engaging students in experiential tasks, role-playing fosters active participation and deeper cognitive engagement, thus extending the theoretical foundation for active learning pedagogies. Furthermore, the study advances the understanding of role-playing as not merely an instructional technique but as a structured framework for integrating experiential learning into economics education.

Taken together, the findings suggest that role-playing should be positioned as a core pedagogical practice in economics classrooms, aligning with contemporary calls for education systems to better equip students with critical 21st-century competencies. As schools continue to adapt curricula to meet global demands, role-playing offers both practical and theoretical contributions to enhancing the quality and relevance of economics education.

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