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Strengthening Students' Understanding of Community Formation Theory through Asset-Based Community Development Mapping: A Workshop for Occupational Safety and Health Students at Universitas Muhammadiyah Lamongan

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Abstract
Students outside the social sciences rarely practise linking social theory with community empowerment. This educational activity aimed to strengthen students' understanding of community formation theory through asset mapping based on Asset-Based Community Development (ABCD). Participants were 71 Occupational Safety and Health students of Universitas Muhammadiyah Lamongan. The two-hour workshop, held on 3 November 2026, used a one-group pretest–posttest design with 15 multiple-choice items. Tabulated student answers and a rubric for the asset matrices of ten groups complemented the test data. Mean scores rose from 70.89 to 89.01 ($p < 0.001$), with a mean N-gain of 0.66 (medium category). Twenty-nine students fell into the high category, 37 into the medium, and five into the low. Group asset matrices scored 79.38 on average (good category). The aspect of fit with ABCD principles scored lowest, at 2.8 out of 4. Students' answers placed self-awareness, mutual cooperation, and social activities as the drivers of an empowered community. Asset mapping appears to be a practical way to learn social theory. These findings need confirmation with a design that includes a comparison group.
Keywords: Community Formation Theory; Asset-Based Community Development; Asset Mapping; N-Gain; Sociology Learning

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INTRODUCTION

Community formation theory is usually studied through texts. Berger and Luckmann (1966) explain that social reality is formed through externalization, objectivation, and internalization. This concept is abstract for students who have never examined residents' lives directly. The difficulty is potentially greater for students in study programs outside the social sciences, such as Occupational Safety and Health (OSH). Teaching social theory in connection with real experience is reported to help students understand theoretical material and apply it (Hunter and Frawley 2022). Active learning reinforces this direction. Freeman et al. (2014) reported that active learning improves student performance in science, engineering, and mathematics. Theobald et al. (2020) add that active learning narrows achievement gaps for students from underrepresented groups. Another form of experiential learning is service-learning. A systematic review shows that service-learning brings benefits to students and communities (Aláez et al. 2022) and is associated with stronger soft skills (Culcasi and Fontana Venegas 2023). Universities also use it as an innovation in education for sustainability (Álvarez-Vanegas et al. 2024).

Asset-Based Community Development (ABCD) offers a concrete entry point for this kind of learning. Kretzmann and McKnight (1993) formulated the approach with the assets a community already holds, rather than a list of problems, as its starting point. Assets are grouped into, among others, human, social, physical, natural, and financial capital. Asset mapping shifts

residents from recipients of aid to agents of development (Mathie and Cunningham 2003). Van Assche and Gruezmacher (2024) regard asset mapping as an integrative method that helps different parties jointly determine what is valuable to a system. In higher education, asset mapping has been used for several purposes. Pérez-Wilson et al. (2022) built an asset map at a university in Chile. Participants described the asset identification questions as a tool for reflection, and students highlighted services, green spaces, and shared spaces as assets. Fauzi et al. (2024) used the discovery, dream, design, and destiny stages to map campus assets in preparation for study program accreditation. Garoutte and McCarthy-Gilmore (2014) showed that asset-based activities help students understand the value of relationships among community members and their own role within them. Goodman et al. (2023) discussed the opportunities and challenges of ABCD in university–community partnerships.

Among young people, asset mapping shifts how the community is viewed. Nam (2022) reported that adolescent asset mappers developed positive perceptions of their neighborhood, practised social and digital skills, and challenged views that emphasize deficits. Suárez-Balcázar et al. (2022) used participatory asset mapping with immigrant families and noted that faith-based organizations were among the main assets they named. Deficit-based views in higher education itself have been criticized (Smit 2012), and asset-based pedagogy is realized through learning routines that give room to learners (Murray-Orr and Mitton 2023). In Indonesia, ABCD is widely used in community service. Machzumy and Ihsan (2024) accompanied villagers in Southeast Aceh through the discovery, dream, design, define, and destiny stages. The concept of social capital inherent in ABCD has a counterpart in the tradition of gotong royong (mutual cooperation). Coleman (1988) and Putnam (2000) view social capital as trust, networks, and norms of reciprocity. Untari et al. (2022) position the value of gotong royong as social capital driven by the collaboration of local actors. Aksa and Afrian (2022) found that coastal residents of Langsa faced tidal flooding through gotong royong. Wulandhari et al. (2022) showed the role of social capital mechanisms in the resilience of a rural cooperative in Indonesia.

The studies on OSH students that the authors found focus on safety awareness and perception (Caner Akın and Çevik Taşdemir 2023; Deniz and Hacibektasoglu 2025). Their understanding of social theory has not been a target. The ABCD studies in higher education that were reviewed map campus assets or prepare students for service-learning. No study was found that measures the understanding of community formation theory among students outside the social sciences through asset mapping. The novelty of this activity lies in two things. Asset mapping is used as a learning tool to interpret the process of community formation, not merely as an action tool. The subjects are OSH students who study social theory outside their home discipline. This article measures the improvement in students' understanding, describes their views on an empowered community, and assesses the quality of the asset matrices prepared by the groups.

RESEARCH METHODS

The activity was carried out as a sociological education and workshop themed "Empowered Communities: Understanding Community Formation Theory". It took place on Tuesday, 3 November 2026, at 14:00 WIB, on the campus of Universitas Muhammadiyah Lamongan (UMLA). The participants were 71 OSH students of UMLA. The presenters came from the Master's in Sociology Team of Universitas Muhammadiyah Malang. The activity lasted about 120 minutes. The design used was a one-group pretest–posttest. Measurements were repeated on the same group before and after the material. The quantitative test data were complemented by qualitative data in the form of students' answers to open-ended questions and the asset matrices produced by the groups. This design is simple and has limitations, which are discussed

at the end of the article. The activity consisted of six stages: opening and pre-test, presentation of community formation theory, presentation of the ABCD approach, a mini workshop on preparing asset matrices, Q&A, and post-test and closing. The theory material refers to social construction (Berger and Luckmann 1966). The ABCD material refers to Kretzmann and McKnight (1993). In the mini workshop, participants were divided into ten groups. Each group read the case study "Building a Caring and Empowered Community", prepared an asset matrix on plano paper, and then presented it. This design follows the learning cycle that connects experience and reflection (Kolb 1984) and Freire's (2000) idea of praxis.

Three instruments were used. First, a 15-item multiple-choice test on community formation theory, social capital, and the ABCD approach. The pre-test and post-test items were identical. Second, four open-ended questions about building a caring, active, and empowered community. The answers of the 71 students were transcribed and tabulated by frequency. Third, a rubric for assessing the asset matrices with four aspects: completeness of asset categories, accuracy of asset grouping, fit with the case and ABCD principles, and quality of ideas for using the assets. Each aspect was scored from 1 to 4. The score was calculated with the formula (total score ÷ 16) × 100 and categorized as very good (85–100), good (70–84), fair (55–69), or poor (below 55). Test scores were calculated as (number correct ÷ 15) × 100. The improvement in understanding was analyzed with normalized N-gain, $g = (\text{post} - \text{pre}) \div (100 - \text{pre})$ (Hake 1998). The categories were high if $g \geq 0.70$, medium if $0.30 \leq g < 0.70$, and low if $g < 0.30$. The score differences were tested with a paired t-test and the Wilcoxon signed-rank test, because the distribution of differences was not normal (Shapiro–Wilk, $p < 0.001$). Effect size was reported as Cohen's d for paired data. Open-ended answers were grouped thematically following the data condensation stage of Miles et al. (2014).

Literature Review

Table 1. Previous studies related to this activity

No.	Author (Year)	Context / Subject	Focus / Approach	Key Findings	Relevance to This Study
1	Hunter & Frawley (2022)	Sociology students	Teaching sociological theory through film, art, and music (arts-based pedagogy)	Linking social theory to real experience helps students understand and apply theory	Supports connecting abstract theory to concrete experience for students outside sociology
2	Freeman et al. (2014)	Students in science, engineering, and mathematics	Active learning in undergraduate courses	Active learning improves student performance	Supports the active learning format used in the mini workshop
3	Pérez-Wilson et al. (2022)	A university in Chile	Asset map in a Health Promoting University	Participants described asset identification questions as a reflection tool; students highlighted services, green spaces, and shared spaces as assets	Shows asset mapping works as a reflection tool in higher education
4	Fauzi et al. (2024)	Study program, Indonesia	ABCD stages (discovery, dream, design, destiny) to map campus assets for accreditation	ABCD stages can be run step by step in community service activities	Shows ABCD use in Indonesian higher education; this study used an abbreviated version
5	Garoutte & McCarthy-Gilmore (2014)	University students	Preparing students for community-based learning with an asset-based approach	Asset-based activities help students understand the value of relationships among community members and their role in them	Supports using asset-based activities to prepare students before community engagement

6	Nam (2022)	Adolescents (Engaging and Empowering Project)	Youth asset mapping of their neighborhood	Youth developed positive perceptions of their neighborhood, practised social and digital skills, and challenged deficit-emphasizing views	Supports the idea that asset mapping can shift deficit-based views, though over a longer project than this single session
7	Untari et al. (2022)	Indonesian villages (Desa Pancasila)	Gotong royong values as social capital	Gotong royong functions as social capital driven by collaboration of local actors	Explains why students' answers centered on gotong royong
8	Aksa & Afrian (2022)	Coastal community in Langsa, Indonesia	Community adaptation to tidal flooding	Residents faced tidal floods through gotong royong	Supports gotong royong as a community resource in facing shared problems

RESEARCH RESULTS AND DISCUSSION

Implementation of the Activity

The activity proceeded according to the six planned stages. The documentation in Figure 1 through Figure 5 is arranged in the order of the event, from the delivery of material to the group photo.



Figure 1. Delivery of material by the presenters from the UMM Master's in Sociology Team

Figure 1 shows the opening of the activity on Tuesday, 3 November 2026, at 14:00 WIB. Two presenters sit in front of a screen displaying the title of the activity and the program flow. A master of ceremonies stands opening the session. Community formation theory was delivered first, before the ABCD approach. This order gave participants a conceptual framework for reading the case they worked on later (Berger and Luckmann 1966).



Figure 2. The Atmosphere As UMLA OSH Students Follow The Material

Figure 2 shows UMLA OSH students seated in rows in the classroom during the presentation. Most participants face the front, and the presentation screen appears on a laptop at the lower left. The classical format was used in the early stage to equalize basic knowledge.

This stage became the foundation for the next stage, which used active learning, reported to improve student performance (Freeman et al. 2014).



Figure 3. Group Discussion Preparing The Asset Matrix

Figure 3 shows the group discussion in the mini workshop stage. Participants sit around the table, write on worksheets, and prepare the asset matrix on plano paper. At the same time, other participants discuss with the person next to them. This discussion places students as builders of knowledge, not merely recipients of material, in line with the ideas of experiential learning and praxis (Kolb 1984; Freire 2000).



Figure 4. Presentation of Group Discussion Results

Figure 4 shows the presentation of one group. Group members spread out a plano sheet containing the asset matrix, and one member holds a microphone to explain its contents to the other participants. The presentation provides an opportunity to reflect on the work and receive feedback, a stage that is part of the experiential learning cycle (Kolb 1984). The presented matrices became material for assessment with the rubric.



Figure 5. Group Photo With Presenters and Participants

Figure 5 is a group photo of the presenters and participants after the post-test and closing. The photo marks the end of the series of activities and shows the participants' involvement from beginning to end. The closeness that formed between presenters and participants is part of the social capital in shared learning (Putnam 2000).

Improvement in Students' Understanding

The improvement in understanding was measured by the difference between pre-test and post-test scores of the 71 students. The results are presented as mean scores, a statistical summary, the distribution of correct answers, and N-gain categories.

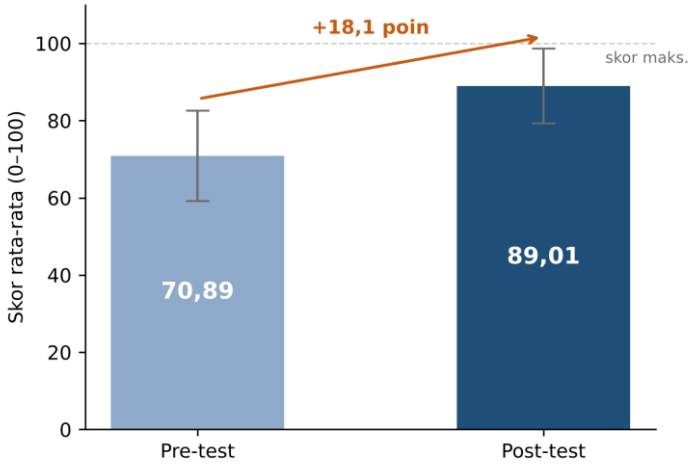


Figure 6. Mean Pre-Test And Post-Test Scores (Error Bars = Standard Deviation, n = 71)

Figure 6 shows that the mean score rose from 70.89 (SD = 11.72) to 89.01 (SD = 9.70). The mean difference was 18.12 points (95% confidence interval: 16.33–19.91). This difference was statistically significant on the paired t-test, $t(70) = 20.16$, $p < 0.001$, and on the Wilcoxon test, $W = 0$, $p < 0.001$. The effect size was large, $d = 2.39$. All 71 students increased their scores, and none decreased or stayed the same.

Table 2. Summary of pre-test and post-test scores (n = 71)

	Pre-test	Post-test
Mean score (SD)	70.89 (11.72)	89.01 (9.70)
Median	73.33	93.33
Score range	46.67–93.33	66.67–100
Students scoring ≥ 80	30 (42.3%)	64 (90.1%)
Students scoring 100	0 (0%)	17 (23.9%)
Students scoring < 60	13 (18.3%)	0 (0%)

Table 1 shows a shift across all measures of central tendency and spread. The median rose from 73.33 to 93.33, and the lowest score rose from 46.67 to 66.67. Students scoring 80 or above increased from 30 (42.3%) to 64 (90.1%). No students scored below 60, whereas in the pre-test there were 13 (18.3%). The standard deviation decreased from 11.72 to 9.70, which means participants' abilities became more uniform after the activity.

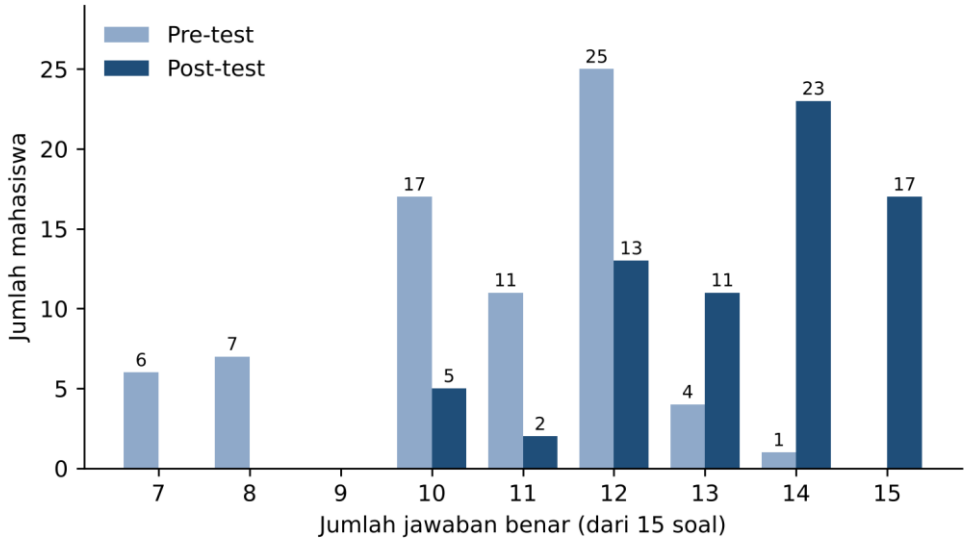


Figure 7. Distribution of the Number of Correct Answers on the Pre-Test And Post-Test

Figure 7 shows the distribution of correct answers shifting to the right. On the pre-test, the mode was 12 correct answers (25 students), and 13 students answered at most eight items correctly. On the post-test, the mode rose to 14 correct answers (23 students), and no student answered fewer than ten items correctly. A total of 17 students answered all items correctly, whereas on the pre-test none did.

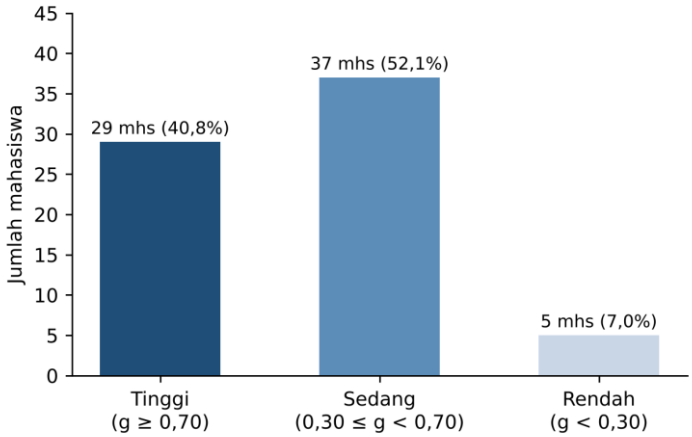


Figure 8. Number of Students by N-gain Category

Figure 8 summarizes the N-gain categories. The mean individual N-gain was 0.66 (SD = 0.24), which is medium. Calculated from the class mean, the N-gain was 0.62 and remained in the medium category. A total of 29 students (40.8%) fell into the high category, 37 students (52.1%) into the medium, and five students (7.0%) into the low. Students with low initial scores (≤ 60; n = 13) obtained a mean N-gain of 0.51. The group with initial scores of 66.67–73.33 (n = 28) obtained 0.62, and the group with initial scores ≥ 80 (n = 30) obtained 0.77. This pattern should be read with caution. Students with high initial scores have little room to increase, so

one additional correct item already produces a large N-gain, and N-gain estimates can be affected by measurement error in the initial score (Navarrete-Ulloa et al. 2026).

Students' Views on an Empowered Community

The four open-ended questions explored students' views on driving factors, ways to increase solidarity, the role of young people, and concrete actions. The answers were multiple, so the number of answers exceeds 71.

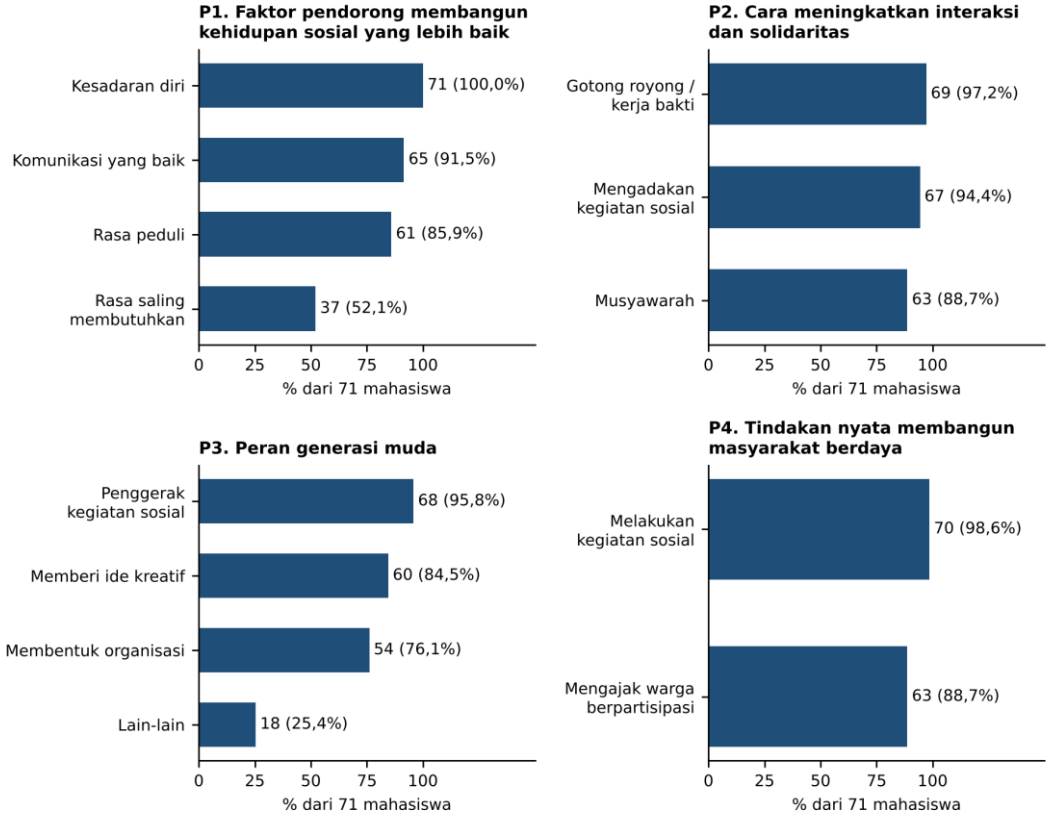


Figure 9. Tabulation of Student Answers to the Four Open-Ended Questions (Multiple Answers; Percentages of 71 Students)

Figure 9 shows that on the first question all students (100%) named self-awareness as what drives residents to build a better social life. Good communication was named by 65 students (91.5%), caring by 61 students (85.9%), and a sense of mutual need by 37 students (52.1%). In ABCD terms, self-awareness can be read as human capital, while communication and caring come close to social capital, namely trust and relationships among residents (Putnam 2000; Coleman 1988). A sense of mutual need was named least often. This pattern suggests that interdependence among residents is not yet as clear as individual awareness in the students' view. On the second question, ways to increase interaction and solidarity were directed at gotong royong or kerja bakti (communal work) (69 students; 97.2%), social activities (67 students; 94.4%), and musyawarah (deliberation) (63 students; 88.7%). All three are forms of cooperation already familiar to residents. These answers are consistent with findings that gotong royong functions as social capital in residents' lives (Untari et al. 2022; Aksa and Afrian 2022). In the framework of Berger and Luckmann (1966), repeated practices like these can form shared habits that are in time institutionalized.

On the third question, 68 students (95.8%) viewed young people as drivers of social activities. A total of 60 students (84.5%) named contributing creative ideas, and 54 students

(76.1%) named forming organizations. Other answers, namely communal work, meetings, and an active karang taruna (youth organization), appeared among 18 students (25.4%). On the reflection question, 70 students (98.6%) wrote doing social activities as a concrete action, and 63 students (88.7%) wrote inviting residents to participate. The actions chosen were participatory and began with oneself. This pattern is in line with the ABCD principle that places residents as agents (Kretzmann and McKnight 1993; Mathie and Cunningham 2003).

Quality of the Groups' Asset Matrices

Ten groups prepared asset matrices from the case study, which were then assessed with the four-aspect rubric. The score recap is presented in Table 3, Figure 10, and Figure 11.

Table 3. Recap of asset matrix assessment for ten groups

Group	Aspect 1	Aspect 2	Aspect 3	Aspect 4	Total (max. 16)	Score	Category
Group 1	4	3	3	3	13	81.25	Good
Group 2	3	3	3	3	12	75.00	Good
Group 3	4	4	3	4	15	93.75	Very good
Group 4	4	3	4	4	15	93.75	Very good
Group 5	3	3	2	3	11	68.75	Fair
Group 6	3	4	2	3	12	75.00	Good
Group 7	4	4	3	3	14	87.50	Very good
Group 8	3	3	3	3	12	75.00	Good
Group 9	3	3	3	2	11	68.75	Fair
Group 10	3	4	2	3	12	75.00	Good
Mean	3.4	3.4	2.8	3.1	12.7	79.38	Good

Note: Aspect 1 = completeness of asset categories; Aspect 2 = accuracy of asset grouping; Aspect 3 = fit with the case and ABCD principles; Aspect 4 = quality of ideas for using the assets

Table 3 shows a mean group score of 79.38, in the good category. Three groups (Groups 3, 4, and 7) were in the very good category, five groups (Groups 1, 2, 6, 8, and 10) in the good category, and two groups (Groups 5 and 9) in the fair category. No group was in the poor category. The highest total score, 15 out of 16, was achieved by Groups 3 and 4, while the lowest, 11, was achieved by Groups 5 and 9.

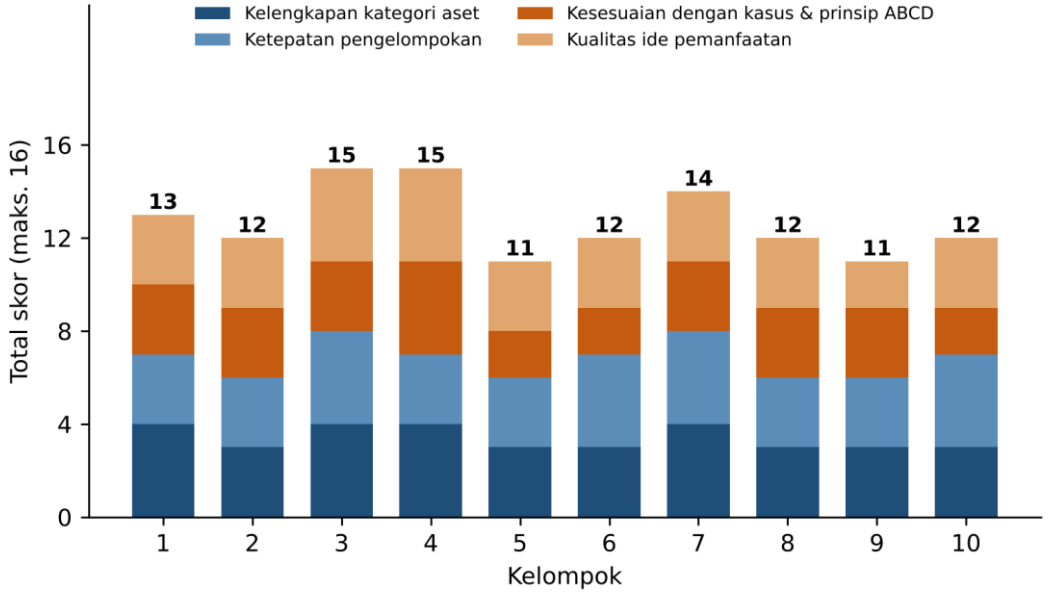


Figure 10. Total Asset Matrix Rubric Score Per Group By Assessment Aspect

Figure 10 shows the composition of each group's score. In the very good groups, all four aspects are filled evenly at a score of 3 or 4. In Groups 5, 6, and 10, the orange segment, namely the aspect of fit with the case and ABCD principles, appears shortest. Group 9 shows its shortest segment on the aspect of ideas for using the assets. This breakdown shows that the groups' weaknesses are not randomly scattered but cluster on particular aspects.

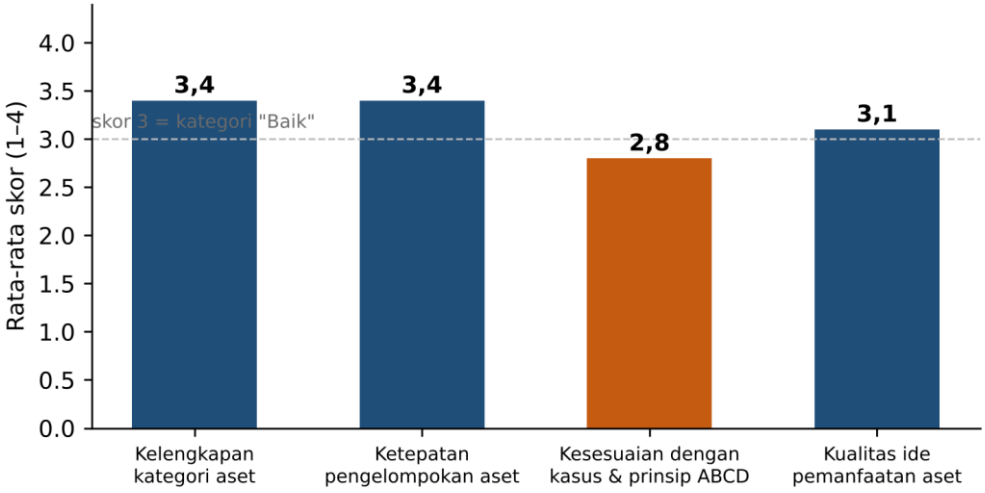


Figure 11. Mean Score Per Aspect of the Asset Matrix Assessment Rubric (Scale 1–4)

Figure 11 shows that the first two aspects obtained the highest means, 3.4 each, and the aspect of quality of ideas for using the assets was at 3.1. The aspect of fit with the case and ABCD principles obtained the lowest mean, 2.8, and was the only one below the good-category threshold. Three groups (Groups 5, 6, and 10) scored 2 on this aspect. According to the rubric, a score of 2 means assets are still mixed with a list of problems or deficiencies.

Discussion

The increase in scores and the medium N-gain show that students' understanding improved after the activity. This result is in line with findings that active learning improves student performance (Freeman et al. 2014) and that teaching social theory in connection with real experience helps students understand and apply theory (Hunter and Frawley 2022). The activity is also consistent with the idea that learning occurs when experience is reflected upon (Kolb 1984). Students did not merely listen to theory. They used it to read a case and prepare a matrix. Preparing an asset matrix can be read as an exercise in understanding community formation. When groups named and grouped assets, they objectified what residents had been living as habit. The grouping was then internalized again through discussion and presentation (Berger and Luckmann 1966). Praxis in Freire's (2000) sense, namely action accompanied by reflection, is also visible in students' answers that emphasize concrete action and inviting participation. The role of this reflection is similar to the asset identification questions used as a reflection tool by participants in the university asset map in Chile (Pérez-Wilson et al. 2022). This reading is interpretive. The activity data are not sufficient to prove the process of internalization in each individual.

The lowest score on the aspect of fit with ABCD principles indicates that a deficit-based way of seeing has not fully shifted in a single session. Deficit-based views in higher education have long been criticized (Smit 2012), and the shift to asset-based pedagogy requires repeated learning routines (Murray-Orr and Mitton 2023). Garoutte and McCarthy-Gilmore (2014) stress the need to prepare students with asset-based activities from the outset. Nam (2022)

shows that asset mapping activities can challenge views that emphasize deficits, but that project ran longer than a single session. OSH education emphasizes hazard awareness and safety culture (Caner Akın and Çevik Taşdemir 2023), so the habit of identifying risks may help reinforce a tendency to see deficiencies. This conjecture needs to be tested with additional data, for example interviews with students.

The pattern of answers to the open-ended questions shows a view centered on shared activities, such as gotong royong, musyawarah, and kerja bakti. That view fits the concept of social capital as networks, trust, and norms of reciprocity (Putnam 2000; Coleman 1988) and the role of gotong royong as social capital in facing shared problems (Untari et al. 2022; Aksa and Afrian 2022; Wulandhari et al. 2022). The lowest percentage, for a sense of mutual need, is worth exploring in future activities. Suárez-Balcázar et al. (2022) noted that faith-based organizations and social service institutions emerged as assets named by residents. In follow-up activities, students can be invited to map such assets in the neighborhood around campus so that the theory they study meets a real community, as is the aim of service-learning (Aláez et al. 2022; Álvarez-Vanegas et al. 2024). Asset mapping done in groups also has the potential to train cooperation and communication skills. Culcasi and Fontana Venegas (2023) reviewed the link between service-learning and soft skills. Fauzi et al. (2024) and Machzumy and Ihsan (2024) show that the ABCD stages can be carried out step by step in community service activities. This activity used an abbreviated version. The dream, design, and destiny stages were not carried out in full, and this becomes material for further development (Goodman et al. 2023; Van Assche and Gruezmacher 2024).

Limitations

Several limitations should be noted. A design without a comparison group does not separate the effect of the activity from other influences. The pre-test and post-test items were identical, so part of the increase may come from recall of the items. The increase among all students also supports this possibility. The post-test was given a few hours after the pre-test, so long-term retention has not been measured. N-gain depends on the initial score and on measurement error (Navarrete-Ulloa et al. 2026), so the figures are read together with the score difference and effect size. The tabulation of open-ended answers shows only frequency and does not show depth of understanding. Inter-rater reliability of the rubric has not been tested. The subjects were students from one institution, so the findings are not intended to be generalized.

CONCLUSION

The ABCD-based asset mapping workshop was followed by an improvement in the understanding of community formation theory among 71 UMLA OSH students. The mean score rose from 70.89 to 89.01 with an N-gain of 0.66 (medium). The groups' asset matrices were in the good category, with weakness in fit with ABCD principles. Students' answers emphasized self-awareness, gotong royong, and social activities. These results suggest that asset mapping has the potential to be a practical way for students outside the social sciences to learn social theory. Similar activities are advised to use parallel test items, a comparison group, and delayed measurement to test retention. Follow-up sessions that train the shift from a deficit-based to an asset-based view should also be designed. Matrix assessment should be done by two raters so that its reliability can be checked.

Novelty of this research lies in the integration of community formation theory with the Asset-Based Community Development (ABCD) approach through participatory asset mapping as an experiential learning strategy for Occupational Safety and Health (OSH) students, who are

generally less exposed to the practical application of social theories. Unlike conventional classroom-based learning that primarily emphasizes conceptual understanding, this workshop positions students as active learners who identify, classify, and analyze community assets while connecting social capital, collective awareness, mutual cooperation, and social participation with the processes of community formation and empowerment. The distinctive contribution of this activity is the application of ABCD-based asset mapping as a contextual pedagogical tool to bridge the gap between sociological theory and community-based practice in an interdisciplinary educational setting. Furthermore, the use of pretest–posttest assessment, N-gain analysis, and group-based asset matrix evaluation provides an integrated assessment of both cognitive improvement and students' practical ability to recognize community potential. Thus, this activity offers an innovative and potentially replicable learning model for integrating sociological perspectives into non-social science education, particularly in preparing OSH students to understand and engage with community empowerment processes.

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