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A meta-analysis of community engaged learning and thriving in higher education

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Introduction: Community Engaged Learning (CEL) is recognized for its positive impact on student development in higher education. This meta-analysis examined the effects of CEL on academic, personal, social, and citizenship outcomes among college students.

Methods: Studies were identified through PsycINFO, PsycArticles, and ERIC, and were included if they met the following criteria: peer-reviewed English-language publications from 2017 to 2024, alignment with widely accepted definitions of CEL, inclusion of a control group, and sufficient data to calculate effect sizes. Random-effects models were used to estimate Hedges's g, a standardized measure of effect size, for each outcome domain.

Results: Our results showed that CEL had a statistically significant, small to medium effect on academic outcomes (Hedges's $g = 0.344$, 95% CI [0.190, 0.497], $p < 0.001$) and social outcomes (Hedges's $g = 0.371$, 95% CI [0.167, 0.575], $p < 0.001$). The effect on citizenship outcomes was small but significant (Hedges's $g = 0.220$, 95% CI [0.096, 0.344], $p = 0.001$). For personal outcomes, the effect was moderate (Hedges's $g = 0.694$, 95% CI [−0.089, 1.477]) but not statistically significant ($p = 0.082$). The substantial variability observed across studies suggests that differences in CEL implementation, program focus, and student populations may influence outcomes.

Conclusion: Overall, our findings highlight CEL as an impactful pedagogy that contributes to academic success, personal growth, and civic engagement. Further research may explore the long-term impacts of CEL and identify specific program components that enhance its effectiveness.

KEYWORDS

community engaged learning, service learning, meta-analysis, higher education, academic success

1 Introduction

Community Engaged Learning (CEL) has gained prominence as an educational approach that blends academic learning with meaningful community service. CEL is also considered a high-impact practice (HIP) because it can have strong, positive effects on student learning (Kuh, 2008). CEL practices have also been known to be effective for students from underserved communities (Finley and McNair, 2013). Helping students thrive in higher education is a central goal, and community engagement has been identified as being a critical component (Fitzgerald et al., 2012). CEL is commonly grouped with related high-impact practices such as Service Learning (SL), Civic Engagement Learning, Community Based Learning, and Community Service Learning, all of which emphasize connecting classroom knowledge with real-world community. Most closely related, SL and CEL represent educational approaches that combine classroom objectives and service related to societal needs. SL has gone through

a number of phases to improve reflection, processes, and systematic and rigorous research (Eyler, 2002; Eyler and Billig, 2003). CEL is considered to have branched out from SL to include intentional collaboration between students and community stakeholders and is a critically reflective form of experiential learning. There is intentional alignment between course learning outcomes and community identified needs with emphasis on co-learning and co-creating (Wurr, 2018; Nguyen and Condry, 2023). Structured reflections are used to explore key issues of knowledge, skills, and values, as well as specific dimensions relevant to the activities are an essential part of the process and growth (Welch and Plaxton-Moore, 2022).

Both CEL and SL stem from the concept of experiential education, meaning students learn through projects or experiences that happen outside the traditional classroom. Experiential learning has been present in educational settings for decades and developed from the work of John Dewey's Experiential Learning Theory (Dewey, 1938/1997). Dewey posited that educators should provide opportunities that foster social, personal, academic growth, and improve citizenship outcomes by expanding outside the traditional classroom (Dewey, 1938/1997). Dewey's work further aligns with Vygotsky's (1978) prominent Sociocultural Theory that emphasizes how individuals develop cognitive functioning by participating in sociocultural practices and making meaningful connections (Vygotsky, 1978; Henderson and Cunningham, 1994).

Aligned with Dewey's (1938/1997) theoretical underpinnings, CEL enriches the educational experience by allowing students to apply course content in practical settings, helping them understand the real-world implications of their education (Eyler et al., 1997; Holdsworth and Sandri, 2021). Community engagement initiatives have also been associated with the development of civic awareness and sense of responsibility toward the community (Coelho and Menezes, 2021). Relevant to Vygotsky's (1978), Sociocultural Theory, research supports that CEL activities are linked with improvements in academic performance indicators such as grades, test scores, and assignment completion (Brail, 2016). Furthermore, CEL has been linked to the enhancement of personal attributes, including self-efficacy, motivation, and interpersonal skills, as students interact with diverse populations and address challenges beyond the classroom (Schunk and Mullen, 2012). Lastly, CEL has been associated with social outcomes like empathy, social responsibility, and involvement (Ryan, 2017).

Although CEL has been recognized as a HIP, associated with enhancement in academic, personal, social, and citizenship performance, research that synthesizes diverse findings to offer a consolidated understanding of its impact on student outcomes is limited. Part of the challenge is that many studies have used small sample sizes and have not included comparison groups. Additionally, a review of existing literature reveals prior research have often focused on specific populations, such as business students (Marco-Gardoqui et al., 2020), pre-service teachers (Toronyi, 2020), English language learners (Wurr, 2018), and students in rehabilitation studies (Eidson et al., 2018), engineering (Natarajarathinam et al., 2021), and audiology (Ronney and Kirby, 2021). Some reviews have explored specialized topics, such as the potential of e-service learning (Stefaniak, 2020) or curriculum development (Mpuangnan and Ntombela, 2024). The most extensive meta-analysis reviewed thousands of articles between the years 1974 to 2017 related to experiential learning and narrowed the analysis to 89 studies that included empirical data (Burch et al., 2019). Burch's work supported the idea that students engaged in experiential learning had superior outcomes and the results were robust across various moderators including the types of learning outcomes being measured (i.e., such as personal, social, etc.). Prior to Burch et al. (2019) work, Yorio and Ye (2012) conducted a meta-analysis examining service-learning in higher education and narrowed their review to 40 articles that included a mix of pre-, quasi, and some true experimental designs. Yorio and Ye (2012) examined outcomes such as increased understanding of social issues, personal insight, and cognitive development. The current study is distinguished by identifying true/quasi experimental design focusing on outcomes of personal, social, academic, and civic engagement and extends the research through the years of 2017 to 2024, including the COVID-19 pandemic period, including various disciplines across a global landscape.

The current meta-analysis focuses on CEL studies from various academic majors and education levels from 2017 to 2024 and contributes to the research by creating a larger data set for examination. Specifically, the examined studies span across disciplines to include medicine, psychology, sociology, education, health, and communications, etc. The studies also take place in various countries across four continents, demonstrating the impact across various cultural settings. In addition, the current meta-analysis has unique timing. The current study includes data that spans across the COVID-19 pandemic. The pandemic presented unique challenges for faculty and students, involved in CEL pursuits, to engage with community partners. The inclusion of the pandemic data into the meta-analysis provides an opportunity to look at student outcomes related to CEL, even though what might be viewed as a time with less optimal learning conditions. Additionally, findings from the current study are ever more important for leaders in higher education as funding is increasingly at risk in the current political context. Exploratory practices are essential in scientific development but backing CEL practices with evidenced-based data will strengthen applications for funding. The enrollment cliff lurking in the horizon of higher education creates surmounting obstacles. In the coming decade, higher education institutions are at risk for lower student enrollment that stem from birthrate decline that followed the Great Recession of 2008 (Kearney et al., 2022). The reality of enrollment decline means that higher education must increase the quality of the educational services to students to bolster retention as well as attract students from the existing pool of candidates. Generally, the goal of higher education is to educate and prepare students for life and career success. From an ethical perspective, most education leaders desire high-impact practices because they are doing right by students. Higher education administrators are interested in high-impact practices that are associated with positive student outcomes (e.g., graduation rates, retention, etc.) and must decide how to distribute funds to support success. Lastly, ongoing assessment of high-impact practices is essential, and the current study adds to the research on CEL which is a high-impact practice (Finley and McNair, 2013). Overall, the current analysis is essential to capture the evolving impacts of CEL, offering valuable and up-to-date insights for educators and stakeholders.

This meta-analysis aims to quantify the effects of CEL on academic, personal, social, and citizenship outcomes that is generalizable across academic disciplines, practical settings, and macro context. Furthermore, the goal is to examine the content of the studies from the meta-analysis to provide anecdotal information that may inform program planning and directions for future research.

2 Methodology

2.1 Information sources and search strategy

A literature search was conducted using PsycINFO, PsycArticles, and ERIC. These databases were selected because they are commonly used in education, psychology, and social science research—areas where CEL tends to be discussed. To support a broad and inclusive search, we drew on a range of terms that appear frequently in the CEL literature: "Civic Engagement Learning," "Community Based Learning," "Community Engaged Learning," "Community Service Learning," and "Service Learning." We included peer-reviewed journal articles published in English between 2017 and December 2024. This timeframe was intended to reflect more recent developments in CEL within higher education, including those taking place during and after the COVID-19 pandemic. The review process was guided by general principles outlined in the PRISMA guidelines (Moher et al., 2015; Page et al., 2021).

2.2 Eligibility criteria

Studies were included in this meta-analysis if they met all six of the following criteria:

- Language and publication date: published in English in a peer-reviewed journal between 2017 and December 2024.
- CEL definition: evaluated a CEL experience aligned with widely accepted definitions, which combine academic content with community service activities.
- Participants: included college students (undergraduate or graduate) as the target population engaged in the CEL activity.
- Control group: included a comparison or control group to allow for the calculation of standardized effect sizes.
- Data sufficiency: reported adequate statistical information necessary for effect size calculation.
- Program focus: focused primarily on CEL as the intervention of interest. Studies were excluded if CEL was one component among several unrelated interventions.

In addition, meta-analyses and review articles were excluded because they do not contain original data needed to calculate effect sizes. Including them could lead to repeated results from the same studies, which may affect the accuracy of the findings. Furthermore, studies that did not include a control or comparison group were excluded to support consistent and interpretable effect size estimates. While meta-analyses can accommodate diverse study designs, we opted to include only studies with a control or comparison group to strengthen the clarity and comparability of outcome data across studies.

2.3 Study selection and data extraction for analysis

The full process of article identification, screening, and selection is summarized in Figure 1. The initial database search yielded 4,932 articles across PsycINFO, PsycArticles, and ERIC. After automatic duplicate removal using EndNote 20, 2,809 records remained, with an additional 29 duplicates removed through manual verification.

Titles and abstracts were then screened by the research team (RG and WZ) to determine preliminary eligibility. At this stage, 2,691 studies were excluded for reasons such as not focusing on CEL, not involving college student participants, or being clearly described as single-group designs without a control or comparison group. Conceptual articles, literature reviews, meta-analyses, and studies that explicitly employed qualitative-only methods were also excluded.

Following this screening, 88 full-text articles were retrieved and assessed against all six inclusion criteria in full detail. Of these, 21 studies met the final criteria for inclusion in the meta-analysis. The remaining studies were excluded primarily due to one or more of the following reasons: absence of a control or comparison group, insufficient statistical data for calculating effect sizes, qualitative-only methodology, or lack of a primary focus on CEL.

Data extraction was initially completed by RG, with WZ independently verifying all entries for accuracy. Post-intervention means, standard deviations, and sample sizes were extracted for both the experimental and control groups when available. For studies that did not report full descriptive statistics, we recorded the available information—such as group means and sample sizes or reported *t*-test values—and noted the direction of the effect to allow for standardized effect size calculation.

RG and WZ worked collaboratively to address any discrepancies or uncertainties during the data extraction process. All differences were resolved through joint discussion and review, and no third-party adjudicator was necessary.

2.4 Statistical analyses

Extracted data were organized in Microsoft Excel and subsequently transferred to Comprehensive Meta-Analysis (CMA) software, Version 4.0, for statistical analysis (Borenstein, 2022). CMA was selected for its capacity to handle diverse effect size metrics and apply appropriate statistical models for meta-analysis, including the random-effects model used in this study.

Four CEL outcome types were used to organize and group various outcomes of the CEL: academic outcomes, personal outcomes, social outcomes, and citizenship outcomes. These categories were based on a similar meta-analysis conducted by Conway et al. (2009) that categorized results according to Billig (2000, 2002), Eyler et al. (2001), and Eyler and Giles (1999), including studies from K−12 and higher education students. The four CEL outcome types included the following

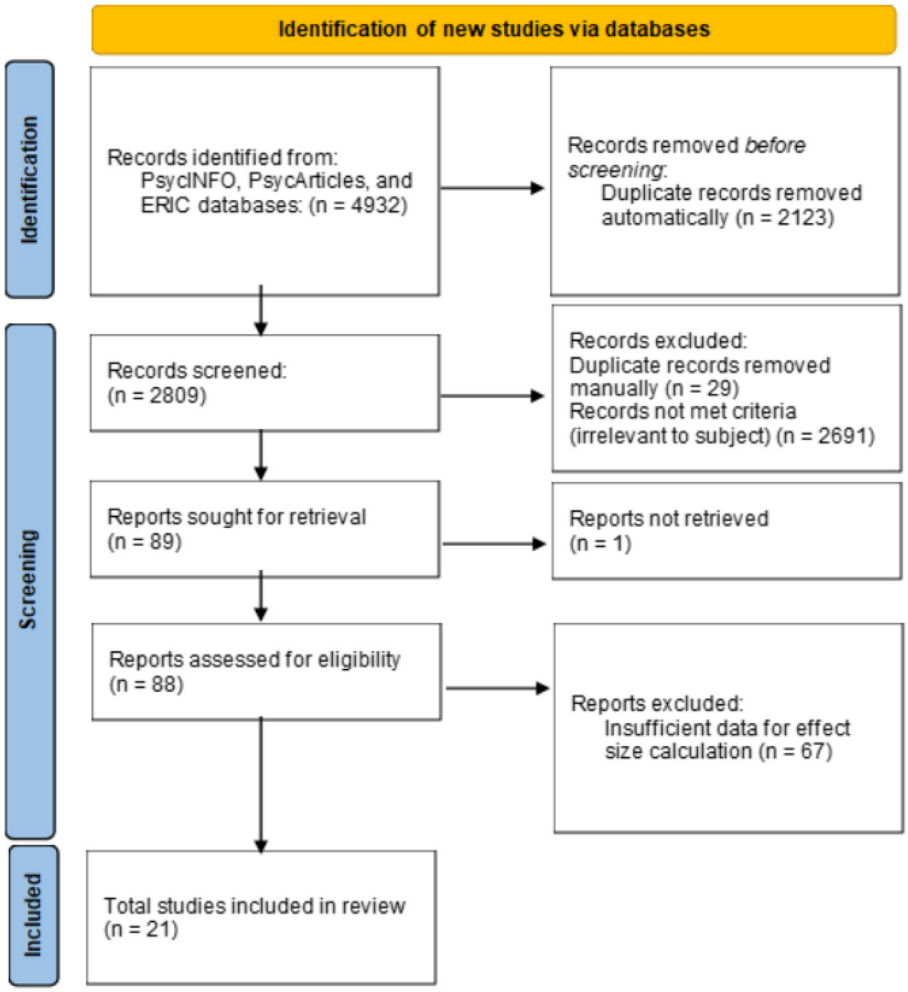

FIGURE 1
Flowchart illustrating literature search and exclusion process.

criteria: (1) academic outcomes (e.g., grades, knowledge, GPA, cognitive outcomes, and academic motivation and attitudes); (2) personal outcomes (e.g., self-evaluations, motivation to volunteer, development in morals, wellbeing, and career development); (3) social outcomes (e.g., improved skills in working with others, understanding or tolerance in diversity, gained knowledge on those served, and change in beliefs or attitudes toward marginalized populations); and (4) citizenship outcomes (e.g., personally responsible citizenship, participatory citizenship, justice-oriented citizenship, and any combination of citizenship types; Conway et al., 2009).

Effect sizes were expressed as Hedges's g, and a random-effects model was applied to account for study variability. A random-effects model was chosen because the included studies varied in their design, participant populations, outcome measures, and CEL implementation contexts. This model assumes that the true effect size may differ across studies and is therefore more appropriate for handling the observed heterogeneity. If a study contained more than one relevant effect size (i.e., multiple outcomes per study), the standard procedure was used to average those scores providing one overall calculation (Braithwaite et al., 2011; Borenstein et al., 2009). The effect size calculations were based on outcomes reported post-intervention to include the broadest set of studies, given that some only provided post-intervention data. Effect sizes were interpreted according to Cohen's (1988, 1992) guidelines, with values of 0.20 or above considered small, 0.50 or above as medium, and 0.80 or above as large.

Heterogeneity was assessed using the Q statistic (with $p < 0.05$ indicating statistically significant heterogeneity) and the I^2 statistic, which quantifies the percentage of total variation across studies attributable to true differences rather than sampling error. The inclusion of both metrics allows for a more comprehensive understanding of between-study variability. The possibility of publication bias was evaluated through visual inspection of the funnel plot for symmetry.

2.5 Ethical consideration

The current study used data extracted from published, peer-reviewed articles that did not include any personal or identifiable

information, so ethics committee approval was not required. The original studies indicated compliance with relevant ethical standards in their respective contexts. This meta-analysis also adheres to recognized ethical guidelines for secondary data use and scholarly reporting.

3 Results

3.1 Characteristics of included studies

The included studies varied widely in sample size, setting, and outcome measures, as summarized in Table 1. They represented a broad range of academic fields (e.g., psychology, communication, business, and medical sciences), and were implemented across different educational levels (undergraduate, graduate, or mixed). Most programs were delivered over the course of a full academic semester, though a few were short-term intensive experiences, such as 1 week program. The types of CEL activities also varied, including direct service, community-based research, and reflective civic engagement projects.

Sample sizes ranged from small cohorts up to 40 participants (e.g., Krishnan et al., 2021; Ryan, 2017) to larger samples exceeding 200 participants (Cattaneo et al., 2021; Valenzuela et al., 2018; Zuzovsky et al., 2024). Some studies reported only post-intervention data, while others provided both pre- and post-intervention data. Although studies were conducted in a range of countries—including Singapore, Slovakia, Italy, Spain, Chile, and Israel—the majority were based in the United States.

3.2 Publication bias

Publication bias was assessed through funnel plots, shown in Appendix A. Overall, we did not observe significant asymmetry in the funnel plots, indicating minimal publication bias across studies included in each outcome domain. Slight variations in symmetry were noted, but these were not deemed substantial enough to indicate selective reporting or publication bias. This minimal bias supports the reliability of our findings as a reflection of the existing literature.

3.3 Academic outcomes

The analysis revealed a statistically significant positive effect of CEL on academic outcomes (Hedges's $g = 0.344$, 95% CI [0.190, 0.497], $z = 4.389$, $p < 0.001$), indicating a small to moderate improvement in students' academic performance (Figure 2). This suggests that incorporating CEL into the curriculum may contribute to higher academic achievement compared to the control condition. The heterogeneity among studies was assessed using the Q statistic, yielding $Q = 16.503$, $p = 0.036$, indicating significant variability across studies. The I^2 statistic was 52%, indicating that approximately half of the variability in effect sizes was due to differences between studies rather than sampling error.

3.4 Personal outcomes

The overall effect size for personal outcomes was Hedges's $g = 0.694$ (95% CI [−0.089, 1.477], $z = 1.737$, $p = 0.082$). While the effect did not reach statistical significance, the magnitude suggests a medium to large potential benefit of CEL on personal development (Figure 3). This may reflect the value of CEL in promoting personal growth, though further research is needed to confirm the effect. The Q statistic was 718.99, $p < 0.001$, indicating significant heterogeneity. The I^2 statistic was 99%, suggesting that nearly all observed variability was due to true differences between studies, possibly related to variations in CEL design, duration, or measurement of personal outcomes.

3.5 Social outcomes

The overall effect size for social outcomes was Hedges's $g = 0.371$ (95% CI [0.167, 0.575], $z = 3.558$, $p < 0.001$), reflecting a small to moderate positive effect (Figure 4). This indicates that CEL may enhance students' interpersonal skills, empathy, and social awareness. The Q statistic was 52.096, $p < 0.001$, and the I^2 statistic was 79%, indicating substantial heterogeneity. Differences in CEL structure, community settings, or targeted social skills may account for the variability in results across studies.

3.6 Citizenship outcomes

The overall effect size for citizenship outcomes was Hedges's $g = 0.220$ (95% CI [0.096, 0.344], $z = 3.477$, $p = 0.001$), representing a small but statistically significant effect (Figure 5). This suggests that CEL may play a role in fostering greater civic responsibility and engagement among students compared to those in the control condition. The Q statistic was 15.805, $p = 0.071$, and the I^2 statistic was 43%, indicating moderate heterogeneity across studies.

Figure 6 summarizes the overall effect sizes for each outcome domain included in the meta-analysis. Academic, social, and citizenship outcomes all demonstrated statistically significant positive effects, while the personal domain showed a moderate effect that did not reach statistical significance. The confidence intervals illustrate the variability in observed effects, with the widest interval found in the personal domain. This summary provides a visual overview of the comparative strength of CEL's impact across different areas of student development.

4 Discussions

4.1 Summary of results

This meta-analysis evaluates the impact of CEL across four key domains, revealing consistent positive effects on academic (Hedges's $g = 0.344$), social (Hedges's $g = 0.371$), and citizenship outcomes (Hedges's $g = 0.220$). While these domains showed statistically significant small-to-moderate effects, personal outcomes demonstrated moderate but non-significant effects (Hedges's $g = 0.694$).

TABLE 1 Characteristics of included studies.

References	Key findings	Course subject	Duration	Sample activities	CEL	Control	Level	Country
Cattaneo et al. (2021)	Experimental group increased in overall outcomes except for individualistic attributions.	Community engagement for social change	Course (semester-based	Helping communities in poverty	113	172	Undergraduate	USA
Compare and Albanesi (2024)	Service-learning students had higher quality of participation experiences.	Community psychology	Course (semester-based)	Meeting needs of the community (eg., donor associations, children, older adults, teens inside and outside of school, underserved communities, and migrants)	43	67	Mixed	Italy
Crawley and Crawley (2023)	The community- based classroom exhibited significantly higher mean scores in the sense of classroom community, connectedness, and learning.	Community-based learning exercise science	Course (semester-based)	Supported seniors through the senior fitness test and strength training	68	54	Undergraduate	USA
Crone (2023)	Service-learning students increased in positive attitudes toward those who experience homelessness.	Social psychology	Course (semester-based)	Students worked with a community partner to target a social issue.	44	19	Undergraduate	USA
Davis et al. (2021)	Intervention group showed an increase in clinical competency, cultural competency, and self-efficacy.	International medical service learning	Short term (1 week)	Primary care, health screening, and education	32	34	Graduate	Singapore
Fleck et al. (2017)	Service learning students outperformed the control group in learning outcomes. Civic engagement did not change significantly.	Integrated SL boys and girls club research project	Course (semester-based)	Assess needs and challenges of club, setting goals	34	33	Undergraduate	USA
Fulton et al. (2023)	Service-learning students depicted statistically significant improvement within diversity attitudes, social justice action, and social justice attitudes.	Pathways to civic engagement	Course (semester-based)	Service-learning project with community organizations in-person (food pantries or clinics) or remotely (research or grant writing).	315	135	Undergraduate	USA
Gregorová and Heinzová (2019)	Service-learning students significantly scored higher in social welfare, duty, performance, performance of responsible acts, and global responsibility.	Interdisciplinary service learning	Course (semester-based)	Planning, time management, setting, and meeting goals	75	32	Undergraduate	Slovakia
Hall (2024)	Service-learning students expressed greater course satisfaction, awareness, and connection to their community.	Personal, social and intellectual development	Course (semester-based)	Composting, growing crops, harvesting, and food distribution	25	24	Undergraduate	USA
Krishnan et al. (2021)	There was a significant increase in the intervention group in intercultural competence and no change from the control group.	Intercultural learning	Spring and summer (3-week activity)	Hearing screenings, cultural outings, clinical observations	21	19	Mixed	USA
Lee et al. (2020)	Significant positive change in self-efficacy and Multidimensional Attitudes Scale Toward Persons With Disabilities for the experimental group.	Kinesiology	Course (semester-based)	Physical activity sessions for individuals with disabilities	28	48	Undergraduate	USA
Macías Gomez-Estern et al. (2021)	Service-learning group exhibited positive change in course relevance, personal learning, and content learning.	Fundamentals of human psychology functioning	Course (semester-based)	Scaffolding method for teaching, organizing class, support teacher	74	105	Undergraduate	Spain

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TABLE 1 (Continued)

References	Key findings	Course subject	Duration	Sample activities	CEL	Control	Level	Country
Nikandish et al. (2023)	Students who supplemented traditional learning with experiential learning exhibited improved scores related to process management.	Service process observation exercise (SPOE)	Course (semester-based)	Observe a real-world business setting, reflect on records, and perform active experimentation	111	174	Undergraduate	USA
Park et al. (2024)	The in-person SL group exhibited a significant increase in attitudes toward disabled person scale compared to the non-SL group.	Kinesiology	Course (semester-based)	Provided exercising sessions for individuals with various disabilities	67	33	Undergraduate	USA
Ryan (2017)	Service-learning group scored higher in empathy and involvement compared to the control group.	Psychology	Course (semester-based)	Nursing homes, assisted living facilities, hospice	21	14	Undergraduate	USA
Sartore-Baldwin and Das (2024)	Service-learning students walked more steps, walked further, and walked with more vigorous physical activity.	Physical activity course	Course (semester-based)	Walking dogs	266	532	Undergraduate	USA
Valenzuela et al. (2018)	Experimental group showed an increase in valued learning and performed better in written reports.	Learning connected to the organizational environment (Marketing course)	Course (semester-based)	Education, real world organization experience	158	158	Undergraduate	Chile
Wang and Calvano (2018)	Service-learning students significantly scored higher in academic learning outcomes compared to the control group.	Consumer Behavior and Principles of Marketing	Course (semester-based)	Recruiting donors for the American Red Cross	70	104	Undergraduate	USA
Warren and Sellnow (2021)	Service-learning students significantly performed better than the control group in the application and performance of a skill.	Public speaking	Course (semester-based)	Problem solving, speeches, lessons	84	92	Undergraduate	USA
Zucchero and Gibson (2019)	Service-learning students outperformed on self-efficacy for community service.	Developmental psychology, child psychology, occupational therapy, and psychology	Course (semester-based)	Mentorship, playing, conversation, listening, creating memoirs	72	89	Undergraduate	USA
Zuzovsky et al. (2024)	Project participants increased in knowledge and civic engagement.	Society culture and identity	Program (1 year, part of 3-year initiative)	Societal issues, education, civic engagement	853	755	Undergraduate	Israel

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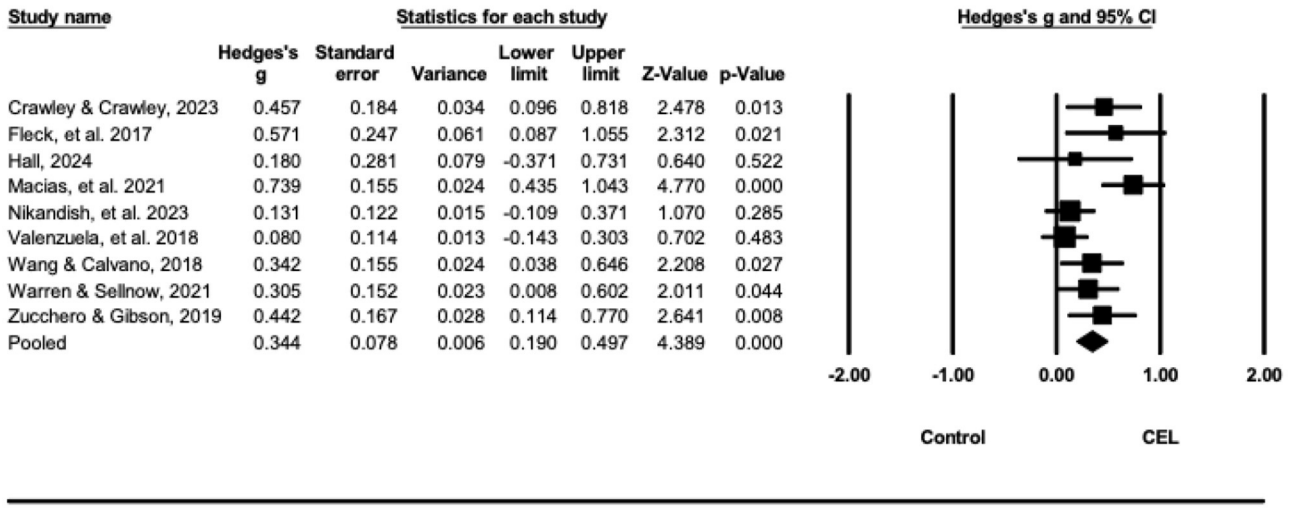

FIGURE 2
Forest plot of CEL's effect on academic outcomes, showing Hedges' g with 95% confidence intervals. The pooled effect size appears at the bottom.

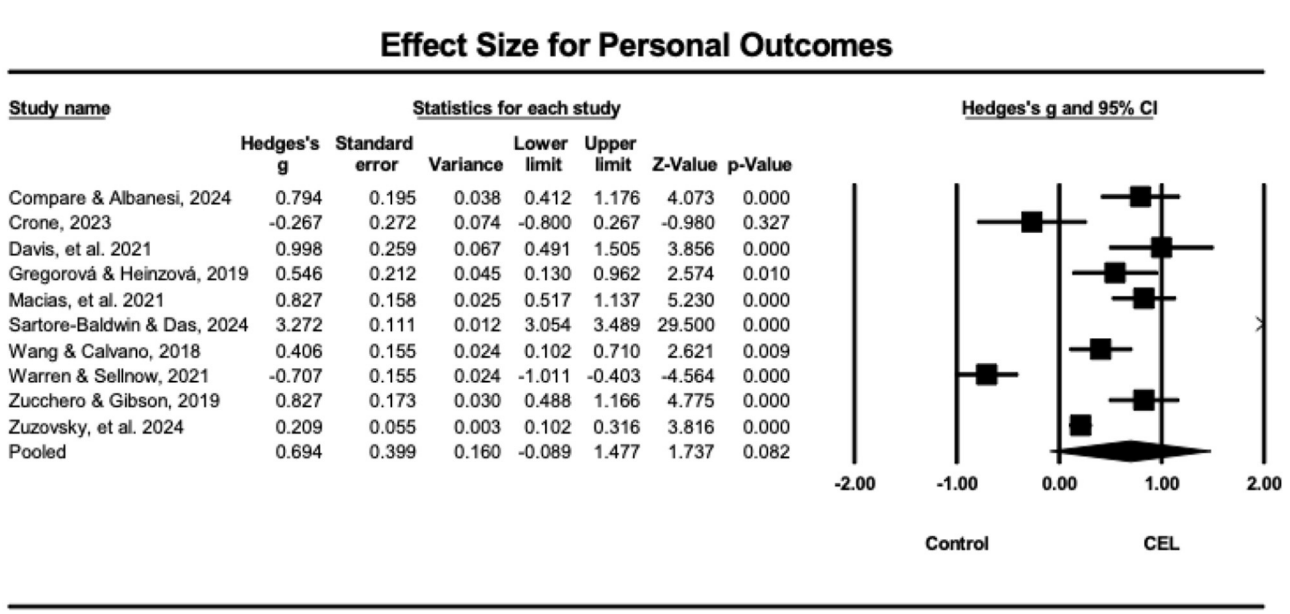

FIGURE 3
Forest plot of CEL's effect on personal outcomes, showing Hedges's g with 95% confidence intervals. The pooled effect size appears at the bottom.

The discussion of non-significant results, such as those for personal outcomes, could be expanded to explore alternative interpretations and implications. For instance, personal development may require longer time frames to emerge or may be better captured through qualitative or reflective methods rather than quantitative measures used in the included studies. One study that may have influenced the personal outcome domain was Warren and Sellnow (2021), which found that non-service-learning students perceived course content as more relevant to their personal and career goals compared to service-learning students. In their study, both the service-learning and control groups (traditional class) performed similarly in cognitive learning, though service-learning students outperformed in skill-based areas. Despite some of the CEL implementation challenges and limited study focus (Warren and Sellnow, 2021), their findings on personal outcomes are

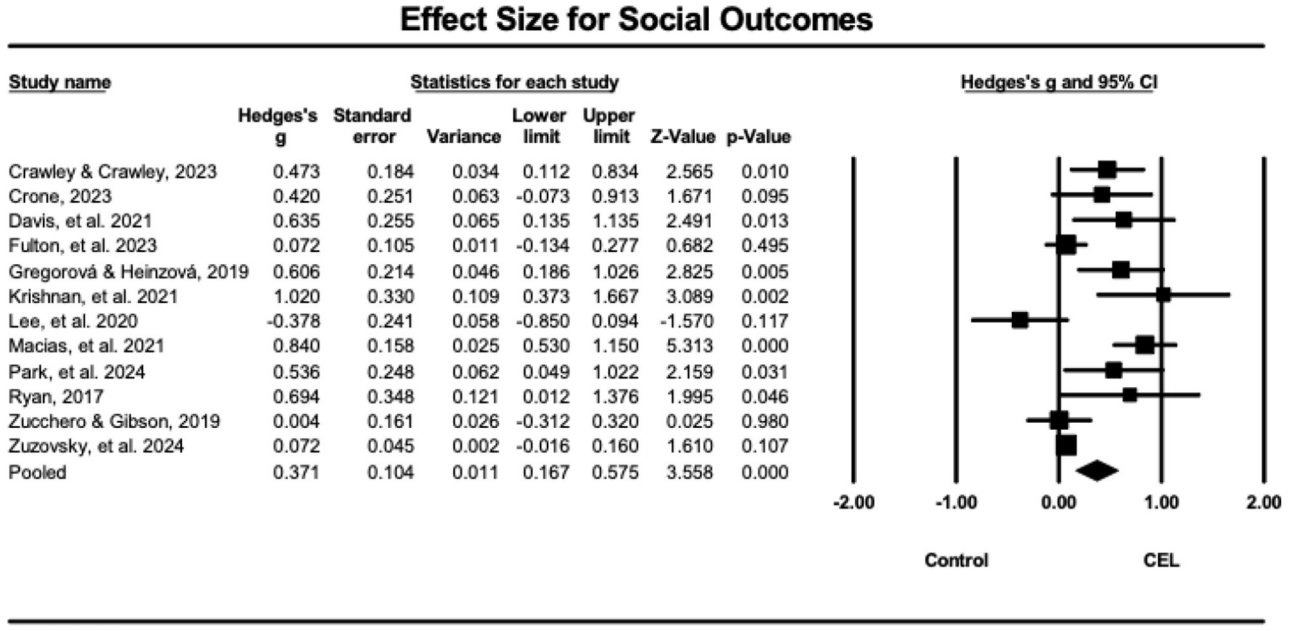

FIGURE 4
Forest plot of CEL's effect on social outcomes, showing Hedges's g with 95% confidence intervals. The pooled effect size appears at the bottom.

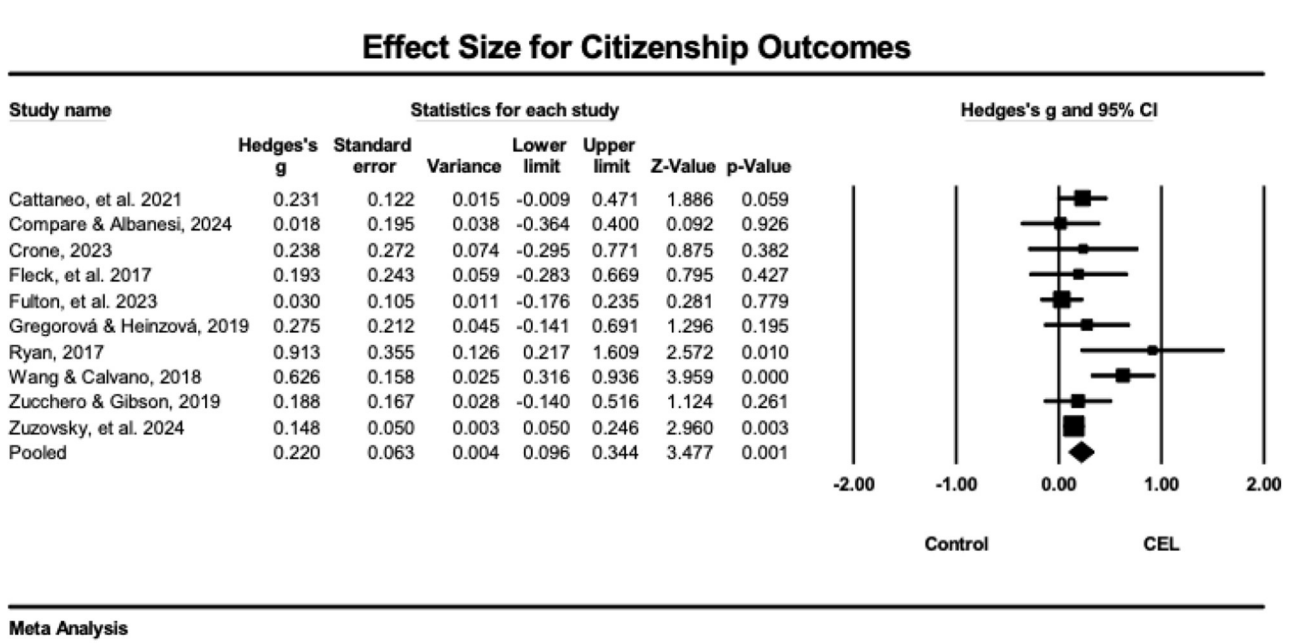

FIGURE 5
Forest plot of CEL's effect on citizenship outcomes, showing Hedges's g with 95% confidence intervals. The pooled effect size appears at the bottom.

consistent with previous literature, such as the work of Conway et al. (2009), which reported similar effect sizes for K-12 and higher education settings. More recently, Crone (2023) also showed mixed results in personal attitude (e.g., self-esteem and self-worth) changes among psychology students working with homeless populations.

4.2 Heterogeneity and contextual factors

The substantial heterogeneity observed across studies (I^2 = 43%−99%) reflects meaningful variation in CEL program design, implementation context, and participant characteristics. This variation is not unexpected given the diversity of higher education

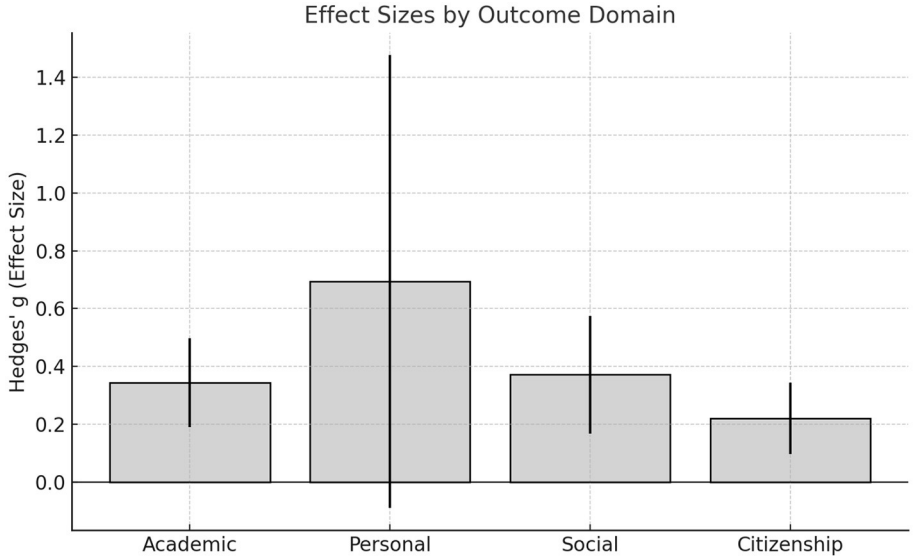

FIGURE 6
Summary of effect sizes by outcome domain. This bar chart displays the pooled effect sizes (Hedges's g) for each outcome domain assessed in the meta-analysis: academic, personal, social, and citizenship. Error bars represent 95% confidence intervals.

institutions, student populations, and community engagement strategies represented in the included studies (see Table 1). Furthermore, heterogeneity variations may stem from the different terms and/or frameworks that used to generate the practices. Although our meta-analysis focused on CEL, we included studies that used overlapping terms, such as CEL, SL, or community based learning. We were guided by course features, such as intentional integration of learning and service, and reciprocal community engagement, although some community engagement scholars make distinctions among these terms.

Studies ranged from short-term intensive programs (e.g., Davis et al., 2021; Krishnan et al., 2021) to semester-long interventions (e.g., Cattaneo et al., 2021; Nikandish et al., 2023; Valenzuela et al., 2018; Zuzovsky et al., 2024). In some cases, such as Cattaneo et al. (2021) and Macías Gomez-Estern et al. (2021), students were involved in structured programs that required them to plan, manage time, and meet specific goals over the course of a semester. Other courses prepared students for short-term immersion experiences, such as the conducted by Davis et al. (2021), that focused on primary healthcare delivery and health education in underserved communities. This intensive format contrasts sharply with semester-long programs like those described by Gregorová and Heinzová (2019) and Valenzuela et al. (2018), where students had more time to reflect and adapt their approach to community engagement. These differences in duration may affect outcomes, especially those related to personal and civic development, which often require time for sustained reflection and community integration.

Academic fields also varied, with CEL integrated into social sciences (Compare and Albanesi, 2024; Ryan, 2017), communication (Warren and Sellnow, 2021), business (Nikandish et al., 2023; Valenzuela et al., 2018), and health sciences (Sartore-Baldwin and Das, 2024). Program activities ranged from health-related service learning (Davis et al., 2021) and business-oriented projects (Valenzuela et al., 2018) to community-focused initiatives (Cattaneo et al., 2021; Zucchero and Gibson, 2019). Each program emphasized different objectives: some prioritized developing clinical or practical skills, such as in Davis et al. (2021) and Lee et al. (2020), while others focused on leadership, community engagement, and personal growth, as seen in Fleck et al. (2017) and Ryan (2017). These differences illustrate the adaptability of CEL across disciplines but also highlight the challenges of drawing generalizable conclusions without more consistent reporting of program design and implementation features.

Each CEL project incorporated varied methods and distinct outcomes. To manage this variability, we categorized outcomes into four domains—academic, personal, social, and citizenship—following the framework established by Conway et al. (2009). For example, academic outcomes included GPA (Hall, 2024), midterm grades (Nikandish et al., 2023) and perceived learning (Zucchero and Gibson, 2019); personal outcomes included empowerment (Compare and Albanesi, 2024), wellness indicators (Sartore-Baldwin and Das, 2024), and self-efficacy (Davis et al., 2021); social outcomes covered empathy (Ryan, 2017), diversity attitudes (Fulton et al., 2023), and intercultural development (Krishnan et al., 2021); and citizenship outcomes encompassed civic action (Fulton et al., 2023), community responsibility (Compare and Albanesi, 2024), and civic engagement (Cattaneo et al., 2021). While this framework facilitated synthesis, the diversity of specific measures within each category also contributes to heterogeneity and suggests a need for more standardized outcome reporting in future CEL research.

Although all included studies incorporated a control or comparison group, the methods used to establish these groups varied widely. In some cases, students self-selected into either the service-learning or non-service-learning group (e.g., Macías Gomez-Estern et al., 2021; Ryan, 2017), while others used matched samples based on characteristics like major or gender (e.g.,

Gregorová and Heinzová, 2019). Many studies compared students enrolled in traditional versions of the same course that did not include a service-learning component (e.g., Warren and Sellnow, 2021; Valenzuela et al., 2018). In Davis et al.'s (2021) study, the control group was formed based on logistical constraints, such as course section or students unable to participate due to scheduling conflicts. Crone (2023) used a design in which students were enrolled in different sections of the same course, unaware of whether a service-learning component was included. While these approaches reflect common educational practices, they may introduce selection or contextual bias. Although many studies reported no baseline differences between comparison groups, more rigorous designs—such as random assignment—could further strengthen internal validity.

Across the included studies, CEL was typically implemented in mid-size public universities or specialized fields, such as medical education (Davis et al., 2021). Some studies incentivized participation, as in Cattaneo et al. (2021), offering research credit or pay, while others did not provide material incentives. Despite differences in structure, duration, and context, the overarching purpose remained consistent: using CEL to better society through student service and to prepare students for the workforce. However, program characteristics such as duration (e.g., week-long vs. semester-long), activity type (e.g., direct service, advocacy, or research-based engagement), and reflection structure may all influence outcomes but were not consistently reported across studies. Future research should consider using common typologies or frameworks when designing and evaluating CEL programs to improve comparability. Additionally, applying subgroup analyses or meta-regressions in future may help clarify how specific program features moderate student outcomes (e.g., Eyler and Giles, 1999).

Finally, CEL's contextual grounding—whether local or global—shaped students' learning experiences. For example, Davis et al. (2021) notably had students interact and practice cross-cultural dialogue, field experience, and were able to broaden their clinical and cultural competence in an underserved community outside of their country. Krishnan et al. (2021) had students travel to India to do clinical observations and screenings, but also had cultural outings during their off time to broaden their experiences with another culture. Other than intercultural diversity, studies like Ryan (2017) and Zucchero and Gibson (2019) highlighted the importance of considering intergenerational exposure and learning based on the targeted communities during the service learning. Valenzuela et al. (2018) noted that the Latin American education system has been evolving to the point where students need to be better prepared in the field of business, so their aim was to specifically have students improve ownership in their learning process with real-world problem solving and network with real organizations. This variation highlights the importance of considering contextual factors when designing and evaluating CEL courses. The included studies span a range of international contexts—including the United States, Slovakia, Singapore, Chile, Italy, Spain, and Israel—reflecting the global adoption of CEL practices. However, we acknowledge that regions such as Africa, South Asia, and parts of Latin America remain underrepresented. Expanding future research to include studies from these regions would enrich the global understanding of CEL's effectiveness and challenges across diverse educational and cultural systems.

4.3 Equity implications

Improving clinical and/or practical skills (Davis et al., 2021; Krishnan et al., 2021) and increasing intercultural exposure (Davis et al., 2021; Krishnan et al., 2021; Zucchero and Gibson, 2019) have been themes among the meta-analysis studies. In Davis et al. (2021) creating firsthand experiences for students to understand social determinants of health was a primary goal of the service-learning experience. Although the program was a short-term, immersive assessment/observational experience (i.e., completed in 1 week), there was year-long preparation, training of faculty advisors, structured meaningful community service, and built in reflection. Davis et al. (2021) highlight the strategic and methodical approach to effective service-learning. In the Davis et al. (2021) study, the program design was intentional with overall goals for medical education which include exposure to understanding social determinants of health, and developing cultural humility. Additionally, students in Davis et al. (2021) who participated in service-learning showed higher self-efficacy compared with the non-service-learning group. Krishnan et al. (2021), a speech-language pathology service-learning immersive experience, obtained results that indicate a significant increase in intercultural competence. Krishnan et al. (2021) identified that accreditation bodies set cultural standards for course curriculum design, but that creating experiential opportunities provide an opportunity to exceed those standards. Both Davis et al. (2021) and Krishnan et al. (2021) were immersive experiences, whereas Zucchero and Gibson (2019) aimed to build intercultural exposure through a semester. In Zucchero and Gibson (2019), undergraduate psychology students spent time with children or the aging populations throughout the semester with self-efficacy being the only significant finding. The study participants are from a midwestern Jesuit school, approximately 86% identified as white and 80% as female with an average high school GPA of 3.73. Also, approximately 55% identified volunteering more than 16 hours per year, prior to the service-learning experience. The researchers, Zucchero and Gibson (2019) highlighted multiple explanations in the discussion, but the homogeneity of the group and school context were likely significant factors. Zucchero and Gibson identified that there was a high pattern of civic engagement among the service-learning participants prior to the intervention and the possibility that the "dose" of service-learning was not sufficient to make a difference.

A closer look at the studies used in the current meta-analysis confirmed continued support for the benefits of CEL. For example, in Ryan (2017), there were significant findings among the service-learning experimental group for prosocial tendencies, empathy, social responsibility, and involvement. In this study, undergraduate students worked with individuals from the aging population that lived in a skilled nursing facility. Although a limitation of the study is that the sample size was small, demographics were also not available to better understand the identity and backgrounds of the participants. In Cattaneo et al. (2021), students who took the service-learning course increased understanding of systemic attribution for poverty, decreased individual attributions, and increased their awareness of class privilege and social justice attitudes. It was also reported that students who experienced more personal financial stress shifted their perspectives from

deficit-oriented thinking toward system-oriented thinking. The study was conducted at a diverse university in the State of Michigan. There were 112 participants in the service-learning group with a racial breakdown as follows (figures rounded): White 30%, African American 12%, Asian American 9%, Hispanic 24%, and Multiracial 10%. While Ryan (2017) and Cattaneo et al. (2021) vary in sample size, they both provide evidence for positive evidenced-based outcomes using CEL pedagogy.

To further elaborate on equity, Hall (2024) utilized service-learning to support food justice at a university serving mainly urban, minority, Hispanic, and first-generation students. Resulting from the service-learning pedagogy, students expressed a connection to campus community, a sense of feeling cared for, greater awareness of food justice issues, and the ability to work toward community-based solutions and grow their critical consciousness. The added service-learning component significantly improved course outcomes. In Park et al. (2024), students studying kinesiology engaged in service-learning by providing exercise activities for participants who identified with various disabilities. The service-learning group scored higher in empathy compared to the control group. Collectively, these studies demonstrate equity for students as well as community groups being served. The studies also approach equity through a broad definition of diversity to include race, ethnicity, ability, gender, socioeconomic status, and more.

4.4 Limitations

Our study has several limitations. First, the inconsistency in the formation of control groups across studies potentially introduces bias. Some studies employed quasi-experimental designs and matched control groups while others did not, leading to potential variances in the baseline characteristics. In some cases, control groups were self-selected and students chose the traditional class or service learning (i.e., Ryan, 2017), whereas the predominant model was having course sections offered traditionally and other course sections offered with a service-learning component (i.e., Cattaneo et al., 2021; Davis et al., 2021; Krishnan et al., 2021). Second, the variations in outcome measures across studies points toward a lack of standardized metrics. For the meta-analysis, outcomes were categorized under academic, personal, social, or citizenship. Within these categories, various measures and sub-scales were used to collect data. This limitation may hinder the comparability of results across studies and the generalizability of the findings. Third, there were variations in the design of the service/community activities across different studies, making it difficult to ascertain which components of CEL are most effective. For example, some studies (i.e., Davis et al., 2021; Krishnan et al., 2021) were more short-term and immersive whereas other studies ran for the entire semester (e.g., Cattaneo et al., 2021; Ryan, 2017). Fourth, several studies were excluded from the meta-analysis due to the absence of a control or comparison group. This decision was made to support consistent effect size estimation and facilitate clearer interpretation of intervention effects across studies. However, it is important to acknowledge that many of these excluded studies offered valuable contextual or qualitative insights (e.g., Goh et al., 2024; Schmidt, 2024; Scheffelaar et al., 2023; Urias et al., 2024). While not included in the quantitative synthesis, such research enhances our broader understanding of CEL by capturing nuanced program experiences, student perspectives, and institutional practices. Future mixed-method reviews may benefit from incorporating these complementary insights to enrich the evidence base.

Publication bias was minimal based on funnel plot symmetry; however, future research may continue to assess and report null or mixed findings to ensure a balanced evidence base. Furthermore, due to our inclusion criteria requiring quantitative data and the presence of a control or comparison group, we excluded several pandemic-era studies that lacked these features. Many of these studies introduced important innovations in CEL during COVID-19 but were primarily qualitative (e.g., Goh et al., 2024; Schmidt, 2024; Urias et al., 2024) or lacked sufficient statistical reporting (e.g., Ngai et al., 2024). For example, Ngai et al. (2024) and Hulan and Bailey-Tarbett (2024) did not include control groups. Others, such as Sweet et al. (2023) and Riaji et al. (2024), compared different formats (e.g., virtual vs. in-person CEL) without including a non-CEL control. While these studies were excluded from our meta-analysis, they provide important contextual insights. Goh et al. (2024), for example, found that students valued the creative freedom and skill-building offered by a digital community archiving project during the pandemic. Sweet et al. (2023) emphasized that virtual CEL is not an exact substitute for in-person engagement, whereas Riaji et al. (2024) reported minimal differences between virtual and in-person implementations. These findings underscore the complexity of adapting CEL to remote formats and highlight the value of further research on hybrid and online models. Future reviews could integrate these perspectives to enhance understanding of CEL's evolving role in times of disruption.

4.5 Implications for teaching, policies, and research

The findings continue to underscore CEL is a high-impact teaching practice that promotes student success in higher education. CEL is a reliable teaching pedagogy that is associated with positive outcomes (e.g., academic, social, psychological, and civic engagement) across heterogeneous groups (i.e., age, gender, ethnicity, race, etc.) that is applicable to undergraduate and graduate students (as well k-12 grades) across various academic disciplines and professional training experiences. CEL includes aspects of community collaboration, reflection, and growth which can be valuable pedagogy for enhancing teaching and learning.

A profound theme among the meta-analysis studies, is that CEL practices can facilitate diversity, equity, and inclusion work within and outside the classroom by influencing attitudes toward cultural awareness. For example, in Cattaneo et al. (2021), a study with diverse participants, found that their CEL exposure to individuals faced with poverty raised greater awareness of self-privilege and skepticism toward deficit based to system-based thinking. Such profound shifts in perspective taking across diverse participants highlight the power of CEL pedagogies as an intervention for

self-growth. The extent of benefits related to equity provide opportunities for positive outcomes for diverse students (Park et al., 2024) and diverse participants (Hall, 2024).

Also, considering diverse populations, CEL offers the opportunity for students, traditional and non-traditional, to engage in service that may otherwise be overly extended with work, school, and/or family obligations. Engaging in service-related work that one might initiate as an individual may require significant time commitments, even beyond researching and connecting with individuals who manage such opportunities, leaving students less likely to pursue such opportunities. Whereas, CEL that is built into coursework, offers structure and guidance to more easily access service-learning opportunities and maximize learning value through reflection. CEL also serves as a pathway to bridge relationships between intercultural groups through collaboration. This strength is ever more relevant in the current context to promote empathy and understanding at micro, mezzo, and macro levels of practice. Many disciplines (e.g., psychology, sociology, business, and health professions) strive to enhance intercultural connectedness, diversity, engagement, and inclusion into the curriculum. When teaching students, it is paramount to consider the intersectionality of cross-cultural learning.

As we embark on the coming decade, many higher education institutions face a decline in student enrollment. This is partly due to the decline in birthrates following the Great Recession of 2008. Beyond enrollment, higher education leaders face greater pressures to ensure that students are prepared for careers and receiving skills-based education as well as developing critical thinking and reflection skills. Administrators can look at CEL as an opportunity to facilitate positive outcomes for students (e.g., academic, social, psychological, and civic mindedness) and improve metrics for grades, graduation rates, and retention. By doing so, they can provide students with meaningful learning experiences that not only enhance academic success but also promote personal growth and civic responsibility. Additionally, campuses seek to achieve increased diversity, engagement, inclusiveness, and belongingness in the campus culture.

It is also important to note that this meta-analysis included studies from 2017 to 2024, a critical period for the implementation of technology in education to address the limitations imposed by the pandemic. Many studies we screened offered valuable perspectives on the impact of the pandemic on community-based learning (Andrade et al., 2022; Arehart et al., 2020) but they lacked the empirical data needed for inclusion. In Andrade et al. (2022), the study focused on the innovation of faculty adjusting CEL courses during the pandemic. The faculty committed to CEL courses were able to make various adjustments to continue their work through the pandemic. Faculty adjustments to CEL could include visiting court sessions through remote access, advocating for policies through use of social media, and/or engaging with community partners through remote platforms. In Arehart et al. (2020), a CEL engineering course shifted from preparing themselves to implement the bridge projects in person, to aiding local communities through remote platforms. Some benefits that unfolded from CEL implementation during the COVID pandemic include maximizing opportunities through remote access. The utilization of remote access allowed more students to engage in courses that may otherwise not be able to commit the time to a CEL course. Overall, CEL during the pandemic highlighted faculty creativity and commitment to CEL. Despite these benefits, future research focused on CEL models that can be effectively implemented and studied online, ensuring adaptability during times of crisis. Beyond times of crisis, effective online CEL could provide opportunities for non-traditional students who may take most of their coursework online to have exposure to and ultimately reap the benefits of CEL related programming.

A large challenge related to CEL data and findings is that many studies include small sample sizes and focus on qualitative analyses and have no comparison group. Although such studies offer value as they add to the nuances of integrating CEL across disciplines and community-based settings, it becomes more difficult to generalize the findings. Future research may assess the long-term impacts of CEL through longitudinal research and explore the mechanisms through which CEL influences various student outcomes. Undoubtedly, CEL has been supported to be a powerful learning tool and transformative experience in some cases. Longitudinal research would follow students' post-graduation to explore later life reflections on their CEL experiences. Another possibility is researching the impact of CEL experiences across the academic career through multiple courses. Within the literature, longitudinal research looked at the long term effects of integrating service learning into a computer science program that contributed to broadening participation in computing and enhancing attitudes and behaviors associated with student success (Payton et al., 2015). A longitudinal study of physical education teachers compared a pre- and two post-test results on civic attitudes and skills post service learning with diverse children (Maravé-Vivas et al., 2022). Maravé-Vivas et al. (2022) found that the attitudes toward diversity did not remain as strong in the second post-test. Considering the number of studies in the meta-analysis that included intercultural experiences and/or diversity, there is a space for further exploration about the long-term impacts of the CEL exposure.

It is evident through a review of all the studies in the meta-analysis that CEL projects that were intentional in their design had some of the greatest student outcomes. To the contrary, some studies were at earlier stages of their projects and still making adjustments. Critical to CEL is that there is alignment between course learning outcomes and community identified needs with emphasis on co-learning and co-creating (Wurr, 2018; Nguyen and Condry, 2023). Although the level of facilitative or transformative approach may vary between partnerships, it is still imperative that the scaffolding is in place to maximize the benefits for both students and the community. Also essential, is that faculty, students, and partners who collaborate have the time to commit to the project and structure to support the community and students. Structured reflections are used to explore key issues of knowledge, skills, and values, as well as specific dimensions relevant to the activities that are an essential part of the process and growth (Welch and Plaxton-Moore, 2022). Continued work to share the successes, challenges and innovative ideas related to CEL is an ongoing process. In the face of Artificial Intelligence (AI), project-based learning becomes more important than ever.

CEL does pose some challenges as it can be more time consuming compared to a traditional lecture course. It also takes more time and commitment by faculty, particularly in instances where they are seeking out and developing a relationship with a new community partner. There also needs to be an approach to partnership so that there are benefits for the community served, community partner, students, faculty, and administration which may include additional access to resources. As such, the Administration can consider policies to support structures to support faculty in CEL implementation. This may include mini grants, release time, overload, co-teaching, and co-curricular partnerships between academic and student affairs. Universities might also consider integrating CEL support through campus centers for teaching and learning and/or civic engagement to support faculty CEL innovation and create opportunities to connect with potential community partners. Resources can be made available to assist the faculty with designing a CEL program, as well as assessing the outcomes. Consideration for events such as a community week or month can create opportunities for CEL initiatives to showcase their work or offer activities that result from collaborations between students in CEL courses and community partners.

5 Conclusion

This study confirms CEL as evidenced-based, high-impact teaching practice that is associated with positive outcomes across heterogeneous groups and disciplines within higher education. Given the nature of many CEL studies that have small sample sizes and utilize qualitative methods alone, the current meta-analysis findings are complementary to the existing research on CEL. Since CEL includes aspects of community collaboration, reflection, and growth, it is a valuable pedagogy for enhancing teaching and learning. CEL also underscores the value of the process of reflection within learning to maximize growth and learning outcomes. Although the studies in the meta-analysis highlighted various positive academic, social, psychological, and civic engagement outcomes, the equity implications are paramount. CEL pedagogy has been effective in generating positive outcomes through various intercultural experiences, with diverse students, and diverse community participants. The intentional process that drives CEL pedagogy can contribute to the organization and wider community. CEL pedagogy enhances educational outcomes that contribute overall university student outcomes success. CEL pedagogy also fosters collaboration that breaks down silos within higher education. CEL pedagogy can also help higher education institutions become increasingly rooted in local communities. As society continues to evolve, the role of education in preparing engaged and informed citizens remains crucial, and CEL stands out as a key strategy in achieving this goal. The heterogeneity in program content, direction, and activities suggests that CEL can be highly flexible and tailored to meet the specific educational goals and make a wider impact on the higher education institution and community.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

RG: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. JP: Funding acquisition, Conceptualization, Writing – original draft, Writing – review & editing. YW: Funding acquisition, Writing – review & editing. WZ: Funding acquisition, Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The author(s) declare that no Gen AI was used in the creation of this manuscript.

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Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2025.1525176/full#supplementary-material

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