

DOES MENTOR COMMUNICATION QUALITY DRIVE RETENTION? EVIDENCE FROM AN ENGINEERING R&D DEPARTMENT

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Abstract

This paper investigates the relationship between communication quality within mentoring programs and employee retention outcomes in a knowledge-intensive engineering context. A quantitative, cross-sectional single-case study was conducted in the eBike Battery Pack department (EB-BP/ENG-RO) of Bosch Engineering Center, Cluj-Napoca, Romania. Structured questionnaires were administered to 17 mentored employees and 7 mentors, supplemented by direct participatory observation. Univariate descriptive analysis and Kendall's tau-b bivariate correlations were used to examine four hypotheses. All four hypotheses were supported within the study sample at $p < 0.05$. Mentoring duration was positively associated with competency consolidation ($\tau = 0.531$), communication effectiveness with employee proactivity ($\tau = 0.629$), mentor-facilitated process understanding with intent to remain ($\tau = 0.557$), and mentor openness and receptiveness with decision-making skill development ($\tau = 0.670$). A significant structural gap was also identified, as 65% of mentees reported receiving no formal end-of-mentoring evaluation. The findings suggest that organizations should consider mentoring periods of 3–6 months, calibrated to role complexity and prior experience, invest in mentor communication training, and implement formal closing evaluation protocols. The study provides exploratory empirical evidence on the communication–retention nexus in engineering mentoring, and highlights the relevance of communication quality, mentor openness, process guidance, and mentoring duration in supporting employee development and retention-related outcomes in a technical R&D context.

Keywords: Mentoring programs, Communication effectiveness, Employee retention, Organizational integration, Knowledge-intensive organizations.

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1. INTRODUCTION

In the current organizational landscape, human capital is widely regarded as the most valuable and difficult-to-replicate asset a company can possess (Zachary, 2007). For knowledge-intensive firms operating in fast-moving technology sectors, the capacity to attract, integrate, and retain talented employees is a critical determinant of long-term competitive advantage. The challenge of employee retention is particularly acute in engineering and R&D environments, where onboarding new hires is costly, ramp-up times are long, and the tacit knowledge embedded in experienced employees is difficult to codify or transfer quickly.

Mentoring programs have emerged as one of the most effective organizational tools for addressing these challenges simultaneously. Meta-analytic evidence confirms that mentoring is robustly associated with positive career outcomes for mentees — including higher salaries, faster promotion, and greater organizational commitment — as well as with reduced turnover intent (Eby et al., 2008; Allen et al., 2004). By pairing less experienced employees with seasoned colleagues or supervisors, mentoring accelerates professional integration, promotes knowledge transfer, and creates relational bonds that increase organizational commitment (Kram, 1985; Ruginosu, 2014).

Despite this evidence, a specific and underexplored dimension of mentoring effectiveness remains the role of communication quality. Communication is not merely a delivery mechanism within mentoring; it is the very substrate of the mentor–mentee relationship. The clarity, frequency, openness, and channel selection of mentor–mentee communication directly shape how new employees understand their roles, build confidence, and develop professional capabilities (Farmer, 2005; Rollnik-Sadowska et al., 2022). Yet few empirical studies examine the granular effects of communication patterns on concrete retention outcomes, particularly in technical engineering settings.

This paper addresses that gap by investigating the communication dynamics within the mentoring program of the eBike Battery Pack department (EB-BP/ENG-RO) at Bosch Engineering Center, Cluj-Napoca. The study examines four specific hypotheses linking mentoring duration, communication quality, process comprehension, and mentor receptiveness to employee retention and behavioural outcomes. The paper is structured as follows: Section 2 reviews the relevant theoretical literature; Section 3 presents the conceptual framework and methodology; Section 4 reports and discusses empirical findings; Section 5 draws conclusions.

2. LITERATURE REVIEW

2.1 Mentoring: definitions, types, and organizational benefits

Mentoring is broadly defined as a voluntary, developmental relationship in which a more experienced individual assists a less experienced one in navigating professional, intellectual, and personal transitions (European Mentoring Centre, as cited in Avram & Cooper, 2008). As a form of structured interpersonal learning, mentoring serves multiple functions: it offers instrumental career support — sponsorship, task guidance, and professional exposure — as well as psychosocial support through counselling, role modelling, and friendship (Kram, 1985). Importantly, the relationship is dynamic: as mentee needs evolve, an effective mentor must continuously adjust the type and depth of support provided (Avram & Cooper, 2008).

The literature distinguishes two primary mentoring typologies relevant to organizational settings. Formal mentoring involves a deliberate pairing with predefined objectives and a structured timeline (Murray, 1991; Connor & Pokora, 2007). In educational and early-career contexts, the mentor's role extends to supporting the newcomer's professional identity formation and pedagogical development (Crașovan, 2004) — a function equally relevant in engineering onboarding, where new hires must rapidly assimilate both technical knowledge and organizational norms. Supervisory mentoring emerges from the hierarchical relationship between a manager and a direct report, offering regular observation opportunities but carrying potential power asymmetry (Scandura & Schriesheim, 1994; Srivastava & Jomon, 2013). While formal mentors focus on removing obstacles to accelerate learning, supervisory mentors concentrate on process creation and contextual sensitization (Srivastava & Jomon, 2013). Research consistently demonstrates that having any type of mentor outperforms having none (Eby et al., 2008; Ensher et al., 2003).

From an organizational perspective, mentoring programs generate substantial returns. Zachary (2007) documents improved retention rates, enhanced employee morale, greater leadership pipeline depth, and stronger team cohesion. Ghosh and Reio (2013) meta-analytically confirm that mentors themselves benefit — experiencing heightened motivation, skill renewal, and organizational commitment — creating a virtuous cycle of mutual development. Meister and Willyerd (2010) specifically note that structured mentoring is especially valued by younger-generation employees, for whom developmental opportunities are a primary retention driver. In the Romanian organizational literature, Axinte (2017) similarly documents that mentoring accelerates career development and professional success, emphasizing its role as a strategic human capital investment. From a broader HRM perspective, Bădescu, Mirci, and Bogre (2008) note that structured developmental relationships such as mentoring are integral components of effective human resources management systems, linking individual competency growth to organizational performance. Additionally, mentoring serves as a succession planning mechanism by identifying future leaders from within a pool already familiar with the organization's culture and operations (Zachary, 2007).

2.2 Communication in mentoring programs

Communication is widely acknowledged as the cornerstone of effective mentoring. Farmer (2005) argues that communication quality is the most distinctive feature separating effective from ineffective mentoring relationships. The construct encompasses multiple dimensions: the channels used (face-to-face, digital, written), the frequency and regularity of interactions, the clarity and completeness of information exchanged, and the relational quality of communication — including active listening, openness, and emotional availability.

Luthra and Dahiya (2015) emphasize that organizational performance depends fundamentally on communication quality at all levels. Within the mentoring dyad, communication serves two essential functions: disseminating information necessary for task execution, and consolidating trust and commitment (Mutuku & Mathooko, 2014). Rollnik-Sadowska, Glińska, and Ryciuk (2022) propose a theoretical model of communication effectiveness in mentoring comprising three interdependent components: (1) channels and tools — oral, written, and non-verbal; (2) content creation — accuracy, clarity, completeness, and responsiveness; and (3) social engagement levels — ranging from mere informing to active co-decision-making. Their empirical findings confirm that non-verbal and written channels, when combined with appropriate digital tools, positively amplify communication effectiveness. The importance of channel selection extends beyond the mentoring dyad: Scheming and Mason (2013) demonstrate that organizations relying on richer interpersonal communication channels — as opposed to impersonal or purely written modes — achieve higher quality information exchange, a principle directly applicable to the design of effective mentoring interactions.

Assertive communication plays a particularly enabling role in the mentoring context (Bîrsan, 2022). Mentees who perceive their mentor as receptive and non-judgmental are more likely to ask questions, seek feedback, and engage proactively with learning tasks — behaviours that accelerate competency development and deepen organizational attachment. This dimension of mentor–mentee communication connects directly to the psychological safety literature (Wanberg et al., 2003): when employees feel safe to express uncertainty without fear of negative judgment, they learn faster and more deeply.

2.3 Mentoring and employee retention

The connection between mentoring and retention is well-established but nuanced. Wilson and Elman (1990) highlight that mentoring contributes not only to individual career outcomes but also to organizational culture perpetuation — a structural retention mechanism. Pânișoară (2006) similarly argues that successful organizational integration, of which mentoring is a key instrument, reduces the psychological distance between the newcomer and the organization, thereby strengthening affective commitment and

reducing voluntary exit intentions. Kram (1983) demonstrates that mentees who feel valued and understood exhibit stronger organizational commitment and lower turnover intent. Meta-analytic evidence from Allen et al. (2004) confirms positive associations between mentoring receipt and multiple career success indicators, with organizational commitment and reduced turnover intent among the most consistent effects.

More recent work underscores the mediating role of competency development. When mentoring programs build skills necessary for career advancement within the organization, employees become less likely to seek opportunities elsewhere (Scandura & Schriesheim, 1994; Zachary, 2007). Wanberg et al. (2003) further demonstrate that the quality of the mentoring relationship — not merely its existence — moderates retention outcomes: superficial or poorly executed mentoring may fail to generate the organizational attachment that effective mentoring produces. This distinction between mentoring presence and mentoring quality is central to the current study's contribution.

3. RESEARCH METHODOLOGY

3.1 Conceptual framework

Figure 1 presents the conceptual model underpinning this study. Four distinct communication-related dimensions of mentoring — duration, effectiveness, process facilitation, and mentor openness — are posited as independent variables that influence employee outcomes through the mediating construct of mentoring communication quality. The outcomes examined span competency consolidation, proactivity, intent to remain, and decision-making skill development, collectively representing the key employee-level consequences of effective mentoring identified in the literature (Kram, 1985; Rolnik-Sadowska et al., 2022; Wanberg et al., 2003).

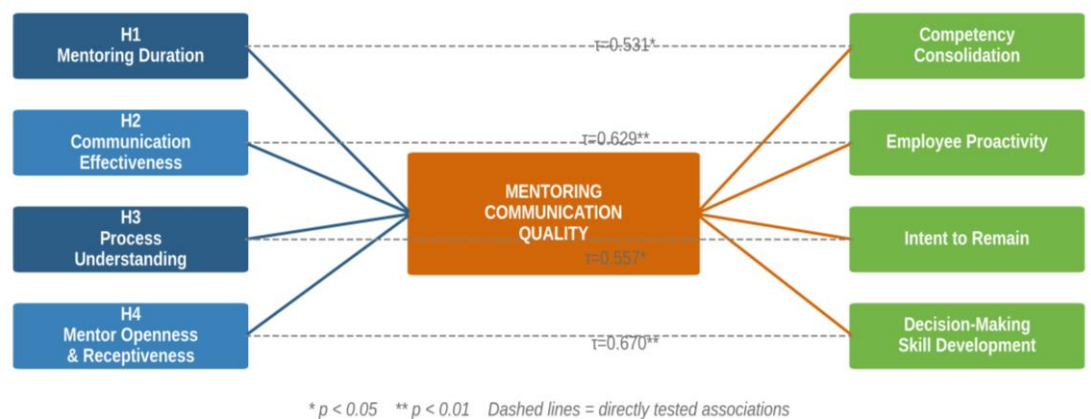


FIGURE 1. CONCEPTUAL MODEL OF MENTORING COMMUNICATION AND EMPLOYEE OUTCOMES

Source: Own elaboration based on Kram (1985), Rolnik-Sadowska et al. (2022), and Wanberg et al. (2003)

3.2 Research context and sample

This study was conducted within the eBike Battery Pack department (EB-BP/ENG-RO) of Bosch Engineering Center, Cluj-Napoca, Romania — a department of 31 engineers across four sub-teams: Project Management, Hardware, Mechanics, and Product Data Management. Bosch Engineering Center Cluj-Napoca was established in 2013 and contributes to AIoT (Artificial Intelligence of Things) solutions for global clients. The EB-BP department operates in close collaboration with Bosch's manufacturing plant in Jucu, Cluj, and is integrated into the global Bosch eBike systems engineering network — a context characterized by high technical complexity, interdisciplinary collaboration, and a sustained need for structured knowledge transfer.

The sample was constructed using purposive (judgment) sampling — a non-probabilistic approach recognized as appropriate for single-case organizational studies where the population of interest is small and fully identifiable (Yin, 2018; Eisenhardt, 1989). Two questionnaires were administered: one to employees who had received mentoring ($n = 17$) and one to employees who had served as mentors ($n = 7$). Together, these 24 respondents constitute a census of all current and past mentoring participants in the department, maximizing coverage within the unit. The study's findings are accordingly interpreted as an in-depth single-case analysis rather than a generalizable survey, consistent with the epistemological positioning of bounded organizational case research (Eisenhardt, 1989; Yin, 2018).

The researcher was an active member of the EB-BP/ENG-RO team and a mentoring program beneficiary, enabling direct participatory observation as a complementary data source. This insider positioning, while providing rich contextual access, also introduces potential social desirability bias — a limitation addressed further in Section 5.

3.3 Research instruments and hypotheses

Data were collected through structured self-administered questionnaires developed using Google Forms and distributed via Microsoft Teams and WhatsApp in May 2024, following a one-month piloting and refinement phase. The mentee questionnaire contained 29 items: 3 open-ended profiling questions, 2 dichotomous items, and 24 multiple-choice items (of which 19 used a five-point Likert scale: 1 = Strongly Disagree to 5 = Strongly Agree). The mentor questionnaire contained 9 analogously formatted items.

Although formal psychometric validation exceeds the scope of this exploratory study, internal consistency was assessed for the four primary Likert subscales. Cronbach's alpha values were: communication quality subscale (3 items) $\alpha = 0.81$; integration outcomes subscale (4 items) $\alpha = 0.76$; competency development subscale (4 items) $\alpha = 0.72$; retention-related outcomes subscale (6 items) $\alpha = 0.69$. The first three

subscales meet the conventional threshold of $\alpha \geq 0.70$; the retention subscale marginally falls below this threshold, suggesting caution in interpreting items from this subscale.

Four research hypotheses were formulated:

H1: Mentoring program duration is positively associated with employee competency consolidation, an antecedent of retention.

H2: Communication quality between employee and mentor is positively associated with employee proactivity.

H3: Mentor-facilitated process understanding is positively associated with employees' intent to remain in the company.

H4: Mentor receptiveness and openness are positively associated with employees' development of decision-making and problem-solving skills.

3.4 Analytical approach

Data were analysed using Microsoft Excel and the wessa.net statistical platform. Univariate analysis described the distribution of all key variables through frequencies and percentages. Bivariate hypothesis testing used Kendall's tau-b (τ) rank correlation coefficient, selected for its robustness with ordinal Likert-scale data, its suitability for small samples, and its resistance to tied ranks. The significance threshold was $\alpha = 0.05$. Effect sizes were interpreted as weak ($|\tau| \leq 0.30$), medium ($0.30 < |\tau| \leq 0.70$), and strong ($|\tau| > 0.70$). Given the cross-sectional, non-probability design, the coefficients are interpreted as exploratory associations rather than causal effects. Four separate tests were conducted without adjustment for multiple comparisons; therefore, p-values should be interpreted cautiously and alongside effect sizes and the study's boundary conditions.

4. RESULTS AND DISCUSSION

4.1 Sample characterization

The mentored employee sample comprised Electronics Engineers (41.18%), Hardware Engineers (23.53%), Mechanical Engineers (23.53%), and Working Students (11.76%), reflecting the technical profile of the department (Figure 2). Among mentors, roles included Team Leaders (28.6%), Technical Project Leaders (28.6%), Hardware Engineers (28.6%), and Mechanical Engineers (14.2%), indicating that mentoring responsibility is distributed across both managerial and senior technical staff.

Regarding organizational tenure, the majority of mentored employees had been with the team for 2–3 years (53%), followed by 1–2 years (29%) and under 1 year (18%). The absence of employees with more

than 3 years in the mentee group reflects the department's recent growth and confirms a sustained, recurring demand for mentoring — consistent with Wanberg et al.'s (2003) observation that rapidly growing technical departments require institutionalized mentoring as a standard onboarding mechanism.

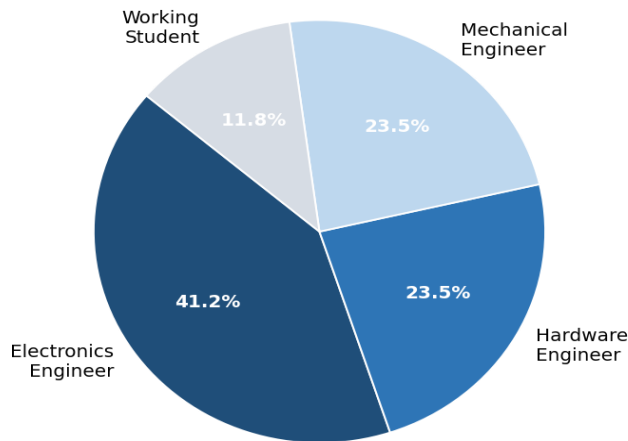


FIGURE 2. POSITIONS OF MENTORED EMPLOYEES
Source: Own processing

4.2 Program structure: duration, frequency, and physical presence

A noteworthy divergence emerged between actual mentoring duration and mentor-recommended duration (Figure 3). While the most frequently experienced duration was 1–3 months (53% of mentees), 42% of mentors recommended 3–6 months as optimal. Only 18% of mentees experienced a 3–6 months program, and a minority (11%) were mentored for 6–12 months — exclusively Working Students requiring extended guidance given the technical complexity of the domain.

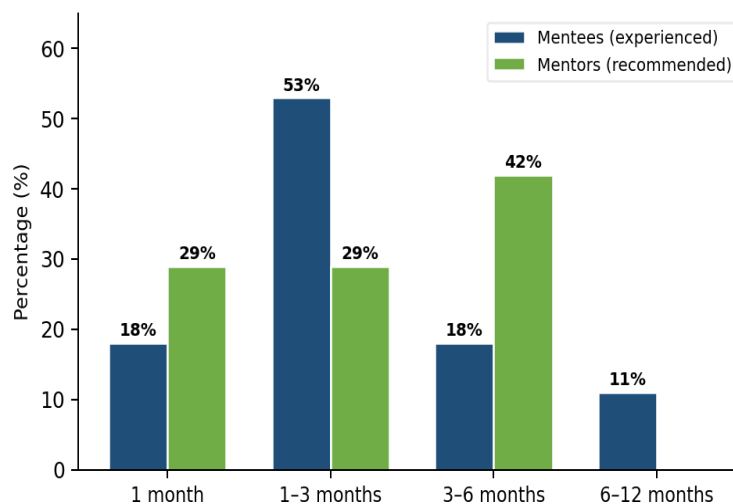


FIGURE 3. MENTORING DURATION: MENTEE EXPERIENCE VS. MENTOR RECOMMENDATION
Source: Own processing

This duration gap — between practice and aspiration — is a structurally significant finding. It suggests that organizational constraints compress mentoring periods below the threshold that mentors themselves consider optimal, with measurable consequences for competency development (addressed empirically in Section 4.5, H1).

Interaction frequency was high across both perspectives (Figure 4). Daily contact was reported by 59% of mentees and endorsed as optimal by 43% of mentors; interaction every 2–3 days was reported by 41% of mentees and recommended by another 43% of mentors. Physical presence at the office was strongly preferred: 59% attended 4–5 times per week. This preference for in-person interaction aligns with the rich-medium literature suggesting that face-to-face communication supports faster trust-building and more effective knowledge transfer (Rollnik-Sadowska et al., 2022).

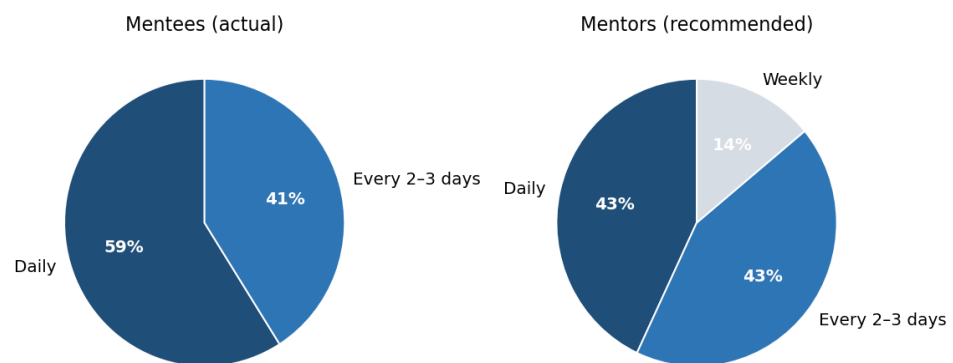


FIGURE 4. MENTOR-MENTEE INTERACTION FREQUENCY

Source: Own processing

Regarding communication channels, face-to-face meetings were preferred (44%), followed by video calls via Microsoft Teams (35%), and text messages (21%). This hybrid model — combining physical meetings with synchronous digital communication — mirrors best-practice recommendations and balances flexibility with relational depth (Rollnik-Sadowska et al., 2022).

4.3 Communication quality: perceptions and descriptive statistics

Table 1 presents descriptive statistics for all 17 Likert-scale items used in the study, grouped by subscale. Communication quality items yielded the highest means (M ranging from 4.35 to 4.65), with the lowest standard deviations ($SD = 0.49$ – 0.79), indicating strong consensus among respondents. Integration outcome items also showed high means ($M = 4.18$ – 4.53). Competency development and retention-related items showed greater variance, with the item measuring decision to remain in the company yielding both the lowest mean ($M = 3.18$) and relatively high dispersion ($SD = 1.01$), reflecting genuine heterogeneity in how mentoring is experienced as a retention factor.

TABLE 1. DESCRIPTIVE STATISTICS FOR ALL LIKERT-SCALE ITEMS (N = 17)

Item	Subscale	M	SD
Communication effective & pleasant	<i>Communication quality</i>	4.35	0.79
Felt listened & understood	<i>Communication quality</i>	4.65	0.49
Could ask freely w/o judgment	<i>Communication quality</i>	4.41	0.51
Team integration facilitated	<i>Integration outcomes</i>	4.47	0.62
Interpersonal relationship development	<i>Integration outcomes</i>	4.18	0.64
Task understanding facilitated	<i>Integration outcomes</i>	4.41	0.71
Process understanding facilitated	<i>Integration outcomes</i>	4.53	0.51
Time management development	<i>Competency development</i>	3.41	1.06
Decision-making skill development	<i>Competency development</i>	3.59	0.87
Professional development contribution	<i>Competency development</i>	3.94	0.66
Career advancement competencies	<i>Competency development</i>	3.94	0.83
Proactivity & responsibility-taking	<i>Retention-related</i>	3.65	0.86
Adaptation to challenges	<i>Retention-related</i>	3.94	0.66
Understanding role expectations	<i>Retention-related</i>	4.06	0.90
Mentor support throughout	<i>Retention-related</i>	4.18	0.64
Overall experience positive	<i>Retention-related</i>	4.35	0.49
Decision to remain in company	<i>Retention-related</i>	3.18	1.01

Note: M = Mean; SD = Standard Deviation; Scale: 1 = Strongly Disagree ... 5 = Strongly Agree.

Source: Own processing

Communication quality was perceived very positively across all measured dimensions (Figure 5). All 17 respondents agreed or fully agreed that they felt listened to and understood ($M = 4.65$, $SD = 0.49$) and that they could ask questions freely without judgment ($M = 4.41$, $SD = 0.51$) — the two highest-rated items in the entire instrument. The complete absence of negative evaluations across all four communication quality dimensions suggests that the mentoring program has successfully cultivated a psychologically safe relational environment consistent with the conditions described by Wanberg et al. (2003) as prerequisites for effective mentoring.

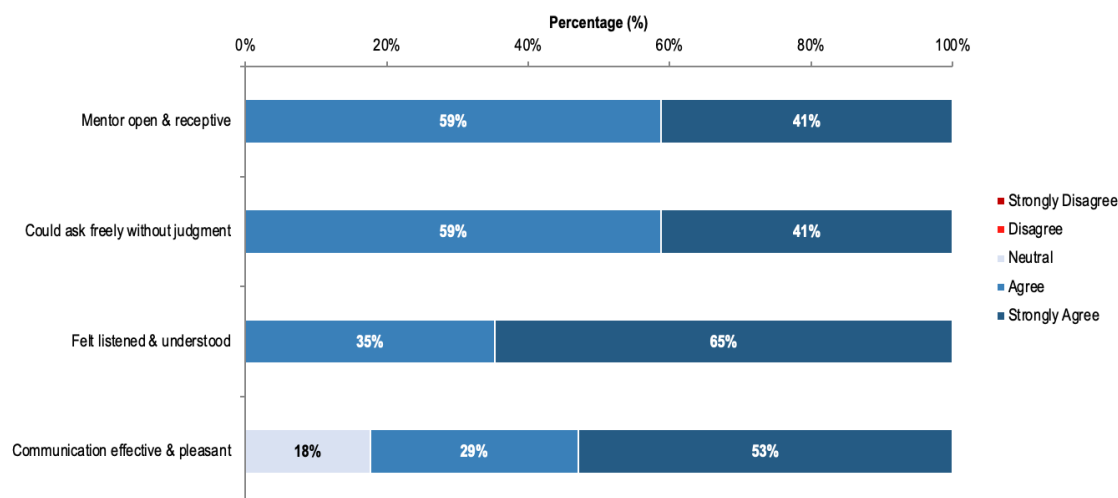


FIGURE 5. COMMUNICATION QUALITY AND MENTOR OPENNESS — MENTEE PERSPECTIVE (LIKERT SCALE)

Source: Own processing

4.4 Impact on competencies and retention outcomes

Figure 6 presents mentoring's perceived impact across seven key outcome dimensions. The pattern reveals a clear gradient: mentoring is perceived as most effective for process understanding (100% positive responses) and team integration and accommodation (94% positive responses), moderately effective for decision-making skill development and career advancement competencies, and most variable for the direct decision to remain in the company.

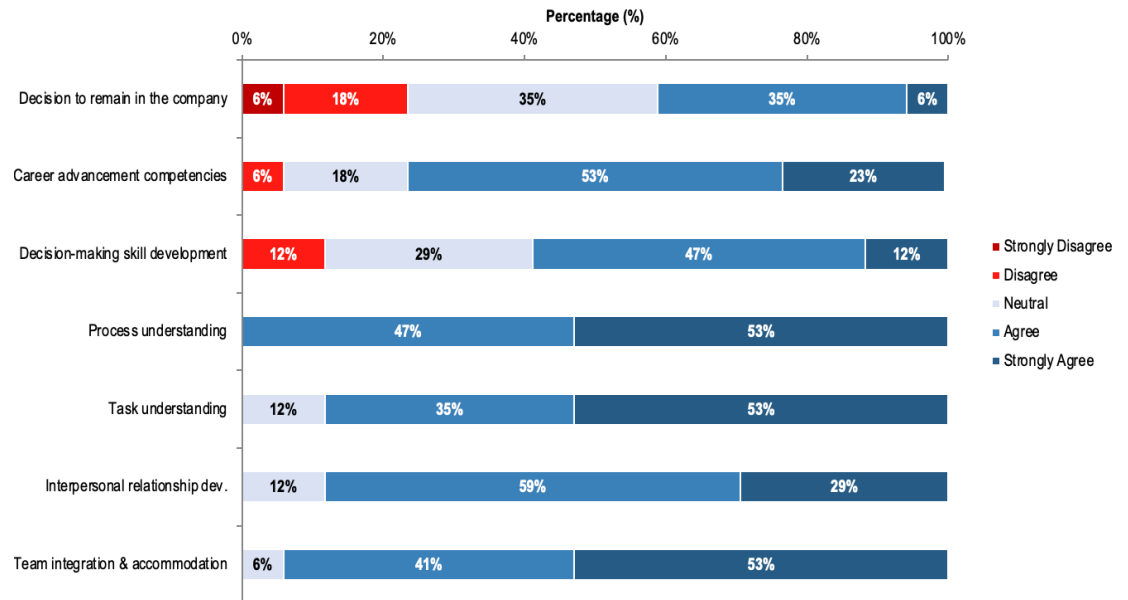


FIGURE 6. MENTORING IMPACT ON KEY COMPETENCIES AND RETENTION OUTCOMES

Source: Own processing

All 17 respondents agreed or fully agreed that mentor-facilitated process understanding was achieved ($M = 4.53$, $SD = 0.51$). Professional development outcomes showed moderate variability: 77% of respondents expressed a positive assessment (59% agreed and 18% strongly agreed) that mentoring helped them integrate new knowledge and experience into their professional development plans, while 23% were neutral. For proactivity and responsibility-taking, the distribution was widest: 53% positive, 41% neutral, 6% disagreed — suggesting that motivational and behavioural outcomes are more contingent on individual characteristics and program quality than competency acquisition effects (Wanberg et al., 2003).

The question of whether mentoring directly influenced the decision to remain ($M = 3.18$, $SD = 1.01$) yielded the most distributed responses (41% agreed, 35% neutral, 24% disagreed or strongly disagreed). This finding is consistent with the multifactorial nature of retention documented by Allen et al. (2004): mentoring is one meaningful retention lever among several, including compensation, team relationships, and career trajectory, and its effect is indirect — mediated by competency development and organizational attachment. Blau, Williams, and Donahue (2016) further emphasize that voluntary turnover, unlike involuntary exits, is predominantly driven by unmet developmental and relational expectations — precisely

the dimensions that effective mentoring is designed to address. Complementarily, Sun, Xu, and Shang (2014) demonstrate that team climate and leadership quality significantly moderate individual retention intentions in knowledge-intensive settings, suggesting that the relational environment shaped by mentoring has effects that extend beyond the dyadic relationship to influence broader team cohesion and commitment.

From the mentor side, perspectives were uniformly positive (Figure 7). All seven mentors agreed or fully agreed that mentoring contributes significantly to retention (86% agreed; 14% fully agreed) and that the program is useful for new employees (29% agreed; 71% fully agreed). Mentors rated their integrative impact as large (42%) or very large (29%) — a level of confidence that, combined with high mentee satisfaction ratings, constitutes a strong indicator of program health and mutual investment.

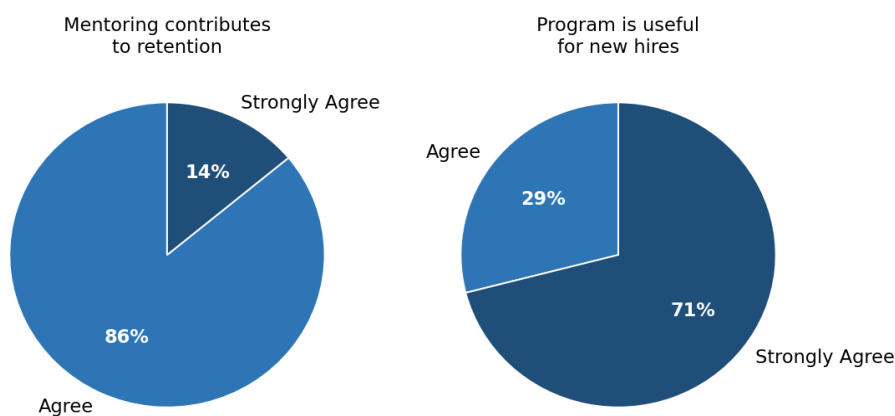


FIGURE 7. MENTOR PERSPECTIVES ON PROGRAM VALUE AND RETENTION IMPACT

Source: Own processing

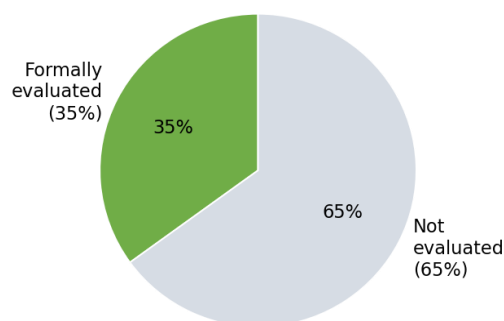


FIGURE 8. FORMAL EVALUATION AT THE END OF THE MENTORING PERIOD

Source: Own processing

A critical structural gap was revealed by the end-of-mentoring evaluation data (Figure 8): 65% of mentees reported no formal closing assessment. This is particularly concerning given meta-analytic evidence on the importance of feedback loops for learning consolidation (Eby et al., 2008; Ghosh & Reio, 2013). Without a

structured closing evaluation, mentees lack formal recognition of progress, and both parties miss the opportunity to identify residual gaps and set goals for the next career phase.

4.5 Hypothesis testing: bivariate correlations

Four Kendall's tau-b correlations were computed to test the research hypotheses. All four yielded statistically significant results ($p < 0.05$) with medium-strength positive tau values. Figure 9 provides a visual summary of all four coefficients.

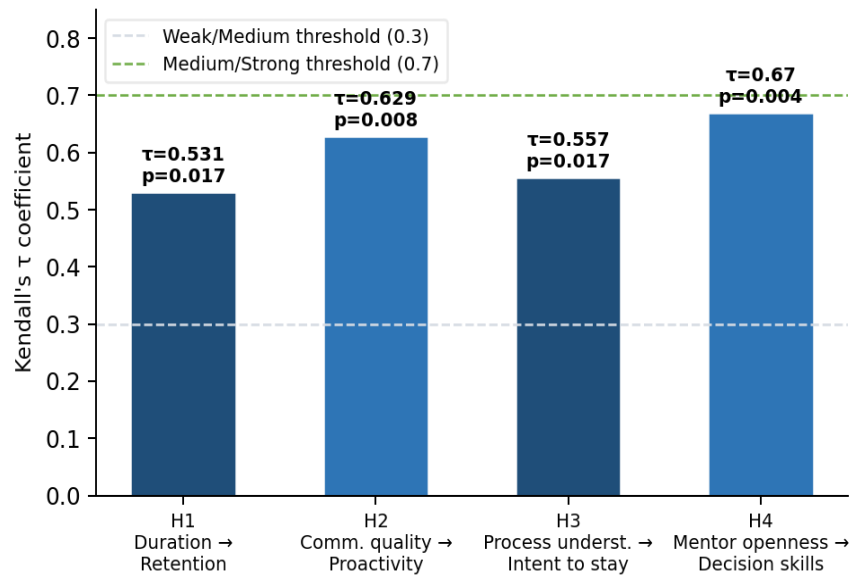


FIGURE 9. SUMMARY OF KENDALL'S T CORRELATIONS ACROSS FOUR HYPOTHESES

Source: Own processing

TABLE 2. CORRELATION: MENTORING DURATION AND COMPETENCY CONSOLIDATION (H1)

Statistic	Value
Variables	Mentoring program duration × Competency consolidation
Kendall's τ coefficient	0.531
Sig. (2-tailed)	0.017
N (valid cases)	17
Hypothesis result	✓ Supported ($p < 0.05$)

Source: own processing

The medium-strength positive correlation ($\tau = 0.531$, $p = 0.017$) supports H1 within this sample: longer mentoring periods were associated with stronger self-reported competency consolidation, which the literature identifies as an antecedent of retention. This pattern is consistent with Eby et al.'s (2008) evidence that mentoring duration is relevant to career outcomes and with Zachary's (2007) practitioner account of deeper development in sustained programs. In conjunction with the gap between actual (1–3 months) and mentor-recommended (3–6 months) durations identified in Section 4.2, the result provides a rationale for testing longer, role-calibrated mentoring periods; it does not, by itself, establish that extending duration will cause improved outcomes.

TABLE 3. CORRELATION: COMMUNICATION EFFECTIVENESS AND EMPLOYEE PROACTIVITY (H2)

Statistic	Value
Variables	Communication effectiveness × Employee proactivity
Kendall's τ coefficient	0.629
Sig. (2-tailed)	0.008
N (valid cases)	17
Hypothesis result	✓ Supported ($p < 0.05$)

Source: own processing

The second strongest correlation ($\tau = 0.629$, $p = 0.008$) supports H2 within this sample and indicates a medium-to-strong positive association. Respondents who rated mentor communication more favourably also reported greater willingness to take initiative and assume additional responsibilities. This finding is consistent with Rollnik-Sadowska et al.'s (2022) model, which links communication effectiveness to mentee engagement and behavioural outcomes. The result supports investment in active listening, constructive feedback, and assertive dialogue, while recognizing that proactivity may also reflect individual dispositions, role design, leadership, and team climate.

TABLE 4. CORRELATION: PROCESS UNDERSTANDING AND INTENT TO REMAIN (H3)

Statistic	Value
Variables	Process understanding × Intent to remain
Kendall's τ coefficient	0.557
Sig. (2-tailed)	0.017
N (valid cases)	17
Hypothesis result	✓ Supported ($p < 0.05$)

Source: own processing

The medium-strength correlation ($\tau = 0.557$, $p = 0.017$) supports H3 within this sample. Employees who reported stronger mentor support in navigating the department's technical processes also expressed greater intent to remain. A plausible interpretation is that process understanding strengthens functional competence and organizational embeddedness (Kram, 1983; Wanberg et al., 2003). However, the study measures stated intention rather than subsequent turnover, and the cross-sectional data cannot establish the temporal direction of this relationship.

TABLE 5. CORRELATION: MENTOR OPENNESS AND DECISION-MAKING/PROBLEM-SOLVING SKILL DEVELOPMENT (H4)

Statistic	Value
Variables	Mentor openness × Decision-making skill development
Kendall's τ coefficient	0.670
Sig. (2-tailed)	0.004
N (valid cases)	17
Hypothesis result	✓ Supported ($p < 0.05$)

Source: Own processing

The strongest correlation ($\tau = 0.670$, $p = 0.004$) was observed between mentor openness and the development of decision-making and problem-solving skills, supporting H4 within this sample. A psychologically safe mentoring space may enable mentees to ask questions, challenge assumptions, and work through complex engineering decisions collaboratively with their mentor—conditions associated with

higher-order skill development (Kram, 1985; Wanberg et al., 2003). Within the present dataset, this was the largest of the four observed associations; replication is needed before treating it as a stable feature of engineering mentoring more broadly.

4.6 Cross-perspective synthesis

Taken together, the four hypotheses were supported within the study sample: each tested mentoring dimension—duration, communication effectiveness, process guidance, and mentor openness—showed a statistically significant positive association with the corresponding employee outcome. The cross-perspective comparison also reveals broad alignment within the department: both groups view mentoring as necessary and beneficial, mentors report confidence in their integrative contribution, and mentees rate communication quality highly. These patterns are internally coherent, but they should not be interpreted as evidence that the same magnitudes will occur in other departments or organizations.

Two structural gaps merit managerial attention. First, the discrepancy between actual mentoring duration (most often 1–3 months) and mentor-recommended duration (most often 3–6 months) suggests a program-design constraint that may limit competency development. Second, the 65% rate of non-evaluation at program close represents an incomplete learning cycle. Both gaps can be addressed through a more explicit program architecture, although the effects of these changes should be evaluated prospectively rather than assumed from the present correlations.

4.7 Broader applicability and boundary conditions

The findings are not statistically generalizable beyond the studied unit, but they may support analytical transfer to other knowledge-intensive settings that share the case's central boundary conditions: complex and partly tacit work, lengthy onboarding, interdependence across specialist roles, and reliance on experienced colleagues to translate formal procedures into practice. Under these conditions, the mechanisms highlighted here—communication clarity, psychological safety, process guidance, and sufficient relationship duration—are potentially relevant to software and IT teams, advanced manufacturing, engineering consulting, R&D laboratories, and other technical or professional-service units. Transfer should concern the underlying mechanisms and program-design propositions, not the numerical effect sizes observed in this small sample (Eisenhardt, 1989; Yin, 2018).

The managerial recommendations are therefore best treated as adaptable design principles. A 3–6 month mentoring period may be appropriate for complex roles, but duration should be calibrated to prior experience, task complexity, and the availability of mentors. Communication training and a formal closing evaluation are comparatively low-cost practices, yet their effectiveness may depend on hierarchy and

power distance, workload, team climate, remote or hybrid work arrangements, and organizational support for mentoring. Multi-site and longitudinal replication is required to determine whether the observed associations persist across organizations, occupations, countries, and program formats.

5. CONCLUSIONS

This study investigated the relationship between communication quality within mentoring programs and employee retention-related outcomes in the eBike Battery Pack department (EB-BP/ENG-RO) of Bosch Engineering Center, Cluj-Napoca. All four research hypotheses were supported within the sample by statistically significant, medium-strength Kendall's tau-b correlations. Collectively, the results indicate that mentoring duration, communication effectiveness, process guidance, and mentor openness are associated with competency development, proactivity, and retention intent in this knowledge-intensive engineering setting.

Theoretically, the findings provide exploratory support for applying the communication effectiveness model of Rolnik-Sadowska et al. (2022) in a Romanian engineering R&D context where empirical evidence remains limited. They also align with Kram's (1983, 1985) relational mentoring framework by showing that psychosocial features—particularly psychological safety and mentor receptiveness—are closely associated with higher-order skill development alongside instrumental guidance. The association between mentor openness and decision-making skill development ($\tau = 0.670$, $p = 0.004$) was the largest observed in this sample and constitutes a proposition for replication rather than a universal estimate.

From a practical standpoint, the study identifies three prioritized recommendations. First, organizations should consider a 3–6 month mentoring period for complex technical roles, with the duration adjusted to prior experience and demonstrated learning needs. Second, mentor communication quality should be developed through targeted training in active listening, constructive feedback, question facilitation, and psychologically safe dialogue. Third, a formal end-of-mentoring protocol should be implemented, combining mentor feedback, mentee self-assessment, unresolved competency gaps, and goals for the next career phase. Because 65% of mentees reported no closing assessment, this is the clearest immediately actionable program-design gap. These recommendations are evidence-informed but should be piloted and evaluated rather than treated as causal prescriptions.

Several methodological limitations qualify the findings. First, the study is a bounded, single-department case based on purposive non-probability sampling. Although the respondents constitute a census of identified mentoring participants in the unit, the small numbers ($n = 17$ mentees; $n = 7$ mentors) limit statistical power, precision, subgroup analysis, and the stability of correlation estimates; they do not

support statistical generalization to Bosch as a whole or to other organizations. Second, the main variables were measured through self-reports collected at one point in time. Common-method variance, recall error, acquiescence, and social-desirability effects may therefore inflate or attenuate associations. The researcher's insider and participant-observer position improved contextual access but may have influenced recruitment, responses, observation, or interpretation, despite requests for honest answers.

Third, the measures capture perceived communication, self-reported competency development, and intention to remain rather than independently assessed performance or actual subsequent turnover. The retention subscale showed marginal internal consistency (Cronbach's $\alpha = 0.69$), and the high, compressed ratings for several communication items create restriction of range. The questionnaire was not subjected to full construct validation, measurement invariance testing, or confirmatory factor analysis. Fourth, the cross-sectional correlational design cannot establish temporal ordering or causality; reverse relationships are plausible, such as proactive employees eliciting better communication from mentors. Potential confounders—including prior experience, role complexity, compensation, promotion prospects, supervisor quality, workload, and team climate—were not modelled. Finally, four bivariate tests were evaluated at $\alpha = 0.05$ without a multiple-testing correction, so the results should be treated as exploratory and interpreted jointly with effect sizes, theory, and replication evidence.

Future research should use larger, multi-department and multi-organization samples; pre-post or longitudinal designs that track actual tenure, performance, and promotion; and, where feasible, quasi-experimental comparisons of alternative mentoring formats or durations. Multi-source measurement—mentee, mentor, supervisor, and administrative HR data—would reduce common-method dependence, while validated multi-item scales and qualitative interviews could improve construct validity and explain the mechanisms behind the correlations. Replication should test whether prior experience, role complexity, personality, power distance, team climate, and remote or hybrid communication moderate the observed relationships.

In conclusion, mentoring programs characterized by frequent, open, psychologically safe, and effective communication appear to be a promising strategic lever for developing and retaining engineering talent. In knowledge-intensive organizations, communication quality within mentoring deserves systematic design and evaluation because it shapes how employees interpret tasks, build confidence, develop competencies, and connect with the organization. The present case offers evidence-informed propositions and actionable program improvements, while the strength and generality of these relationships remain questions for broader longitudinal research.

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DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the revision of this manuscript, the authors used OpenAI ChatGPT (GPT-5.6 Thinking) to support language editing, the organization of responses to reviewers' recommendations, and consistency checks of in-text citations and the reference list. The tool was not used to collect, generate, or analyse research data. All suggested changes, factual statements, references, and interpretations were independently reviewed, verified, edited, and approved by the authors, who take full responsibility for the final content.

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