

# Professionelle Identitätsbildung von Notfallsanitäter-Auszubildenden im deutschen Berufsbildungssystem: Eine Mixed-Methods-Untersuchung

## Professional Identity Formation of Paramedic Trainees in the German Vocational Education and Training System: A Mixed-Methods Study

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### Zusammenfassung

**Hintergrund:** Die Entwicklung einer beruflichen Identität (PIF) hilft Notfallsanitäter:innen, ihre Rolle, ihren Zweck und ihre Werte zu verstehen und stärkt ihre Belastbarkeit in schwierigen Arbeitsumgebungen. Notfallsanitäter:innen (NotSan) Auszubildende in Deutschland lernen im Rahmen eines dualen Berufsbildungssystems, wie sie NotSan werden. Sie stehen gerade vor besonderen Herausforderungen, beim Aufbau ihrer beruflichen Identität (PI) in diesem System, wie zum Beispiel Akademisierung, ein wachsender Tätigkeitsbereich und ein Beruf, der über die traditionellen Aufgaben der präklinischen Notfallversorgung hinausgeht.

**Zielsetzung:** Die Studie untersuchte die PIF bei NotSan Auszubildenden in Deutschland. Sie zielte darauf ab, die selbstberichtete PI zu beschreiben, Ausbildungsfaktoren zu identifizieren, die ihre Entwicklung beeinflussen, und zu analysieren, wie Bildungsträger die PIF besser unterstützen können.

**Methodik:** Es wurde ein sequenzielles erklärendes Mixed Methods-Design verwendet. Eine Online-Umfrage unter NotSan-Auszubildenden ( $n = 377$ ) umfasste demografische Fragen und eine deutsche Version der Macleod Clark Professional Identity Scale (MCPIS-9). Die quantitative Analyse umfasste deskriptive Statistiken, interne Konsistenz, ANOVA und Pearson-Korrelation. In halbstrukturierten hermeneutisch-phänomenologischen Interviews ( $n = 15$ ) wurden Erfahrungen der Auszubildenden mit PIF untersucht. Es wurde eine reflektierende thematische Analyse durchgeführt, und die Integration der Daten erfolgte anhand der Role Identity Theory und der Checkliste Mixed Methods Reporting in Rehabilitation & Health Sciences (MMR-RHS).

**Ergebnisse:** Die Teilnehmenden berichteten von starken PI-Werten (MCPIS-9-Mittelwert 38,13/45, SD = 4,5; Bereich 18–45; Cronbachs  $\alpha = 0,795$ ). Es gab einen signifikanten Zusammenhang zwischen höheren MCPIS-9-Werten und längerer geplanter Beschäftigung im Rettungsdienst ( $F(5,371) = 12,264$ ,  $p < 0,001$ ,  $\omega^2 = 0,130$ ). Die Interviewteilnehmenden beschrieben eine ausgeprägte Wachstumsmentalität und betonten, dass Praktika im Rettungsdienst die PIF unterstützen, während Praktika im Krankenhaus häufig Verwirrung und Rollenkonflikte verursachen. Auszubildende schätzten unterstützende Mentoren im Rettungsdienst, berichteten jedoch häufig von mangelnder Anleitung und begrenztem Verständnis für die NotSan-Rolle im Krankenhaus.

**Fazit:** Das deutsche Berufsbildungssystem scheint die PIF bei NotSan-Auszubildenden gut zu unterstützen. Praktika im Rettungsdienst bieten Möglichkeiten zur Identitätsentwicklung, während schlecht strukturierte Klinikpraktika diese Entwicklung beeinträchtigen können. NotSan-Schulen sollten die Zusammenarbeit mit Krankenhäusern stärken, verlässliche Betreuung durch Mentoren sicherstellen und nicht-klinische Fähigkeiten

sowie eine Wachstumsmentalität explizit fördern. Die Ergebnisse liefern Basisdaten für zukünftige Forschung in einer wichtigen Phase des Bildungs- und Berufsübergangs im deutschen Rettungsdienst.

## Abstract

**Background:** Professional identity formation (PIF) helps paramedics understand their role, purpose, and values, and it supports resilience in challenging work environments. NotSan trainees (German paramedic trainees) learn how to become paramedics within a dual vocational education and training (VET) system. NotSan currently face specific challenges when forming their professional identity (PI) within this system, including academisation, an expanding scope of practice, and a profession extending beyond traditional prehospital emergency care roles.

**Purpose:** The study examined PIF among NotSan trainees in Germany. It aimed to describe trainees' self-reported PI, identify training factors influencing its formation, and explore how education providers can better support PIF.

**Methods:** A sequential explanatory mixed-methods design was used. An online survey of NotSan trainees ( $n = 377$ ) included demographic questions and a German version of the Macleod Clark Professional Identity Scale (MCPIS-9). Quantitative analysis included descriptive statistics, internal consistency, ANOVA, and Pearson's correlation coefficient. Semi-structured hermeneutic phenomenological interviews ( $n = 15$ ) explored trainees' lived experience of PIF. Reflexive thematic analysis was conducted, and integration of data was guided by Role Identity Theory and the Mixed Methods Reporting in Rehabilitation & Health Sciences (MMR-RHS) checklist.

**Results:** Participants reported strong PI scores (mean MCPIS-9 of 38.13/45,  $SD = 4.5$ ; range 18-45; Cronbach's  $\alpha = 0.795$ ). There was a significant association between higher MCPIS-9 scores and longer planned employment in EMS ( $F(5,371) = 12.264$ ,  $p < 0.001$ ,  $\omega^2 = 0.130$ ). Interview participants described a strong growth mindset and emphasised that ambulance placements support PIF, while hospital placements often create confusion and role conflict. Trainees valued supportive mentors on ambulances but frequently reported a lack of guidance and understanding of the NotSan role in hospitals.

**Conclusion:** The German VET system appears to support PIF among NotSan trainees. Ambulance placements offer opportunities for identity verification. However, poorly structured hospital placements can undermine developing professional identities. NotSan schools should strengthen cooperation with hospitals, ensure adequate clinical instructor support, and explicitly teach non-clinical skills and growth mindset. These findings provide baseline data for future research during an important period of educational and professional transition in German EMS.

## Schlagwörter

Notfallsanitäter:innen, Berufliche Identität, Berufliche Bildung, Berufsschule, Rollenidentitätstheorie

## Keywords

Paramedic, Professional identity, Vocational education and training, Vocational school, Role Identity Theory

## Introduction

Professional identity formation (PIF) in paramedic trainees involves more than learning skills or knowledge. It is a process of professional socialisation in which trainees explore the origins, purpose, and unique role of the paramedic profession and gradually begin to embody its values and ways of being (Hill & Eaton, 2023). PIF strengthens coherence, provides meaning and purpose, and enhances the ability to cope with stress (Ericsson et al., 2024). It has been linked to job satisfaction, resilience, and positive cultural change within professions (Johnston & Bilton, 2020; Lazarsfeld-Jensen, 2014; Mausz et al., 2022; Phillips & Trenoweth, 2023). At the same time, PIF is a complex and fragile process shaped not only by formal education, placement experiences and workplace culture, but also everyday interactions with colleagues and patients (Trede, 2009).

The German emergency medical service (EMS) education system provides a unique environment to explore PIF. Currently, Paramedic (NotSan) trainees undertake a three-year vocational education and training (VET) programme in a dual training system, including approximately 1,920 hours of classroom-based theory and skills training, 1,960 hours on EMS stations, and 720 hours in hospital departments. Ongoing debates on the academisation of the NotSan profession and the introduction of bachelor's degree programmes highlight the growing importance of understanding how professional identity (PI) develops within the existing VET pathway.

In Germany, these processes take place amid structural change (Gottschalk et al., 2024), with state-level differences in EMS organisation,

local regulations, and debates about NotSan scope creating inconsistent expectations across regions and institutions.

Earlier national surveys have raised concerns about future workforce stability, with a considerable proportion of trainees indicating plans to leave EMS within a few years of qualification (Elsenbast et al., 2024; Lehweß-Litzmann & Hofmann, 2022). Against this background, there is a clear need for empirical evidence on how current VET structures influence PIF and how education providers can better support trainees in developing a stable and sustainable PI.

Role Identity Theory (RIT) (Stryker & Burke, 2000) provides a useful framework for examining PIF in this setting. According to RIT, individuals construct a sense of self through taking on different roles. Taking on the role of paramedic involves learning what the professional community expects of a paramedic, and incorporating this into their sense of self. Each role holds a different level of importance (role salience), with more important roles affecting a person's behaviour more strongly. For NotSan trainees, roles are learned and negotiated across several learning environments: VET schools, EMS services, and hospitals. In each setting, trainees encounter explicit expectations about what a paramedic should know and do, as well as implicit messages about status, autonomy, and responsibility. When external feedback aligns with a trainee's internal understanding of the role, identity is verified and strengthened; when expectations conflict, this can produce role strain, doubt, or even a wish to leave the profession (Garratt, 2021; Lazarsfeld-Jensen, 2014; Mausz et al., 2022).

RIT is complemented by constructivist learning theory (Piaget, 1972), which emphasises that knowledge and identity are built through active engagement with real situations rather than being passively received. Curricula focusing on practical placements provide opportunities for this experiential learning (Kolb, 1984). Experiential learning on ambulances and in hospitals allows trainees to apply theoretical concepts to dynamic, sometimes chaotic scenes, to reflect on their own performance, and to test out new professional behaviours. “Experiential learning enhances (paramedic) students' ability to apply theoretical knowledge in dynamic situations, contributing significantly to their professionalism.” (Weber et al., 2024). Previous research suggests that such experiences can support professionalism and improve patient communication and care (Ross et al., 2018), but they can also reinforce negative cultures or role confusion when guidance is lacking.

Using the lens of RIT and constructivist learning theory, this study aimed to address three questions:

1. What is the current self-reported PI of NotSan trainees in the German VET system?
2. What do trainees believe to be the main factors within the VET system that influence their PIF?
3. How can NotSan education in Germany best support trainees' PIF?

### **Study Design and Methods**

This research used a sequential explanatory mixed-methods design (quant → QUAL) to explore PIF from the perspective of NotSan trainees. A national online survey provided an overview of self-reported PI and its relationship

with demographic and training variables. One-to-one hermeneutic phenomenological interviews then added depth by examining how trainees interpreted and internalised their educational experiences. RIT guided the integration of findings and supported interpretation of convergences and divergences between the two data sets. This study followed the Mixed Methods Reporting in Rehabilitation & Health Sciences (MMR-RHS) checklist guidelines (Tovin & Wormley, 2023).

### **Quantitative**

The survey was delivered via SoSci Survey and targeted all currently enrolled NotSan trainees in German VET programmes (n = 10,594 (DESTATIS, 2024)). It contained demographic questions and a German version of the Macleod Clark Professional Identity Scale (MCPIS-9) (Adams et al., 2006), a nine-item, five-point Likert scale widely used to measure PI in health and social care students. A published German back-translation of MCPIS-9 was obtained (Faihs et al., 2023), and an expert panel consisting of a bilingual paramedic researcher, a bilingual NotSan instructor, a VET school principal, and a lead fire service instructor reviewed and adapted terminology for the target population. For example, 'Profession' was replaced with 'Beruf' (occupation) and 'Mitglied' (member) with 'Angehörige' or 'Beschäftigte' to reflect the non-registered status of NotSan.

The revised survey was piloted with 10 German EMS personnel, who confirmed clarity and appropriateness. With a 95% confidence level and 5% margin of error, an ideal sample size of 371 was calculated (Qualtrics, n.d.). Recruitment took place through VET schools, professional networks, and social media. The

survey remained open for one month and participation was voluntary and anonymous. Quantitative analysis included descriptive statistics, internal consistency (Cronbach's  $\alpha$ ), and separate univariate ANOVAs examining MCPIS-9 scores across gender, previous EMS training, educating organisation (e.g., aid organisation, fire department, army), and planned job longevity. Pearson's correlation was used to examine the relationship between year of training and intended duration of employment in EMS.

### Qualitative

At the end of the survey, participants could provide an email address to volunteer for an

interview. Fifteen trainees from eight federal states were interviewed online in German using Microsoft Teams. Interviews lasted 40–60 minutes and followed a semi-structured guide (Table 1) exploring experiences of classroom learning, ambulance placements, hospital placements, and perceptions of the NotSan role. Sessions were audio-recorded and automatically transcribed, then manually checked and anonymised.

Reflexive thematic analysis (Campbell et al., 2021) was conducted as it enables flexible, reflexive and interpretive engagement with participants' meaning-making, whereas more traditional qualitative approaches tend to remain more descriptive and structured.

**Table 1**

*Semi-structured interview guide*

Item	
1	When you imagine yourself as a fully qualified paramedic, what qualities do you already have for this role and what do you still need to take on this role?
2	Were there any particular experiences or moments during your training that strongly influenced your understanding of what it means to be a paramedic?
3	How has your self-image as a future paramedic changed since you started your training? What do you think led to these changes?
4	Which parts of your training do you find most important for your development as a paramedic? Are there any areas that you think could be improved?
5	If you have previously worked in the emergency services or have family members working in healthcare, how has this influenced your understanding of the profession of paramedic?
6	If you had an important mentor during your training, how did this person shape your understanding of what it means to be a professional paramedic?
7	How do you think the current changes in the German emergency medical services are influencing the professional self-image of trainees and emergency paramedics?

The analysis paid particular attention to emotionally charged statements and strongly contrasting perspectives, consistent with the hermeneutic focus on meaning-making and the RIT concept of identity verification. Data saturation in the strict sense was not achievable because of the non-standardised nature of VET curricula and EMS structures across Germany.

### Reflexivity Statement

The primary researcher was educated in an Anglo-American paramedic system and currently works as a freelance trainer in German VET schools. This insider status provided valuable contextual knowledge but also created risks of confirmation bias, interviewer bias, and subjective bias (Cohen et al., 2011), and a tendency towards more 'professionalised' views of paramedicine.

Potential biases were addressed through the use of an expert panel, semi-structured interviews, mixed-methods triangulation, and ongoing reflexive journaling. The researcher's first language is English, which may have influenced interviews conducted and analyses performed in German; this was mitigated by careful translation and a focus on preserving the original meaning of participants' statements.

### Results

The survey received 459 responses, of which 377 met the inclusion and consent criteria and were sufficiently complete for analysis. Participants represented 15 federal states. 36% were female, slightly below the 41% in the target population (DESTATIS, 2024). The majority of respondents ( $n = 263$ ) were

emergency medical technicians (EMT; Rettungssanitäter, RettSan).

The mean MCPIS-9 score was 38.13 out of a possible 45 (SD = 4.5), with scores ranging from 18 to 45 and demonstrating good internal consistency (Cronbach's  $\alpha = 0.795$ ). Figure 1 displays mean MCPIS-9 scores by year of training for full-time NotSan trainees. There was no significant correlation between year level and PI ( $r = -0.097$ ,  $p = 0.161$ ). There were no significant differences in mean MCPIS-9 scores between female and male participants. Two participants declined to report their gender and one identified as non-binary. These three cases were excluded from the gender-based comparisons.

**Figure 1**

*Mean MCPIS-9 scores by year level of training*



A key quantitative finding was the strong association between MCPIS-9 scores and planned job longevity. The longer participants intended to work in EMS after qualification, the higher their PI scores ( $F(5,371) = 12.264$ ,  $p < 0.001$ ,  $\omega^2 = 0.130$ ). Nevertheless, almost 3% of respondents reported that they did not plan to work in EMS at all after training ( $n = 11/377$ ; 2.9%, 95% CI [1.5, 5.2]), and 13.5% expected

to remain for less than five years (Table 2). These patterns suggest that while most trainees feel committed to the profession, a notable minority are already considering early exit.

**Table 2**

*Mean MCPIS-9 scores and planned job longevity*

Planned Job Longevity	n	Mean	SD	CV
Abstention	13	39.69	3.68	0.09
Not at all	11	32.55	7.67	2.31
Up to 5 years	51	35.41	5.42	0.76
Up to 10 years	87	37.55	3.96	0.42
Up to 20 years	84	38.58	3.66	0.40
Until retirement	135	39.61	3.75	0.32

The qualitative interviews included 15 participants from eight federal states. 40% of interviewees were female, and participants varied in age, prior education, and work experience, including school leavers, university graduates, and mature learners changing career path.

Integration of survey and interview data revealed multiple points of convergence. Interview participants expressed a strong sense of commitment and a clear desire to grow into the NotSan role, consistent with the high MCPIS-9 scores among those planning longer careers. Many described a pronounced growth mindset when reflecting on stressful or

challenging experiences, emphasising learning from mistakes, seeking feedback, and actively working to improve their clinical skills and communication (examples in Table 3).

### **School Law & Communication Subjects**

Participants reported that the theoretical subjects law and communication had a positive impact on PIF. Law classes clarified the legal framework, responsibilities, and limits of the NotSan role, giving trainees a sense of security about what they were allowed and expected to do. Communication training helped them interact with patients from diverse backgrounds and in crisis situations. However, several trainees felt that the amount of communication teaching was insufficient given its importance.

They argued for more extensive and earlier communication training, including conflict management and interprofessional interaction, to better support their developing PI. There was evident tension between what was taught in school and what was observed on ambulances. One participant stated that *“the autonomous work that was sold to us at school; that we would learn, that we have a lot of skills and that we have a lot of specialist knowledge and so on, or will have at the end of our training, but we rarely see that being applied out on the streets.”* (P9). Such discrepancies create role conflict and raise questions about how identity can be negotiated between educational ideals and workplace realities.

**Table 3**

*Growth mindset*

	When you imagine yourself as a fully qualified paramedic, which qualities of that role do you already have, and what do you still need in order to take on that role?
<b>P4</b>	I would rather say that it never really stops. That you keep working on yourself, and that a lot of it is connected to experience.
<b>P5</b>	Simply reflecting on my actions, even if something went wrong during a call out. Discussing it afterwards is just something you have to do so you can develop further.
<b>P8</b>	And just having flexibility, that you can simply handle the incident or the situation, even if it doesn't follow algorithm XY.
<b>P13</b>	There's still a lot that I want to learn, that I can learn, and that I can deepen my knowledge about.
<b>P14</b>	It's important to me that I continue my education afterwards, because I'm aware that my education doesn't end with the completion of my training. Especially in our profession, it's important to keep learning continuously.
<b>P15</b>	The work routine is missing, but that just have to develop now over time
	Were there any particular experiences or moments during your training that strongly influenced your understanding of what it means to be a paramedic?
<b>P6</b>	Being a professional doesn't just mean perfectly mastering every procedure and always being able to do everything flawlessly. It also means having proper error management, knowing that mistakes will happen. Ideally, those mistakes are not serious ones, but it's important to handle them properly, always reflecting and considering what you can do better next time.
	How has your mentor shaped your understanding of what it means to be a professional paramedic?
<b>P3</b>	I'm generally a person who always wants to learn, who always wants to keep learning. I take part in an incredible number of courses and online trainings.
<b>P10</b>	He's always really up to date, and I think that's something I've taken with me. That you're only really good at this job, or stay good at it, if you continue to pursue further training.
	How, in your opinion, do the current changes in the German emergency medical services affect the professional identity of trainees and paramedics?
<b>P11</b>	When I think about my future as a paramedic, I always want to stay up to date, and these things need to be practiced and repeated.

### **Ambulance Placements**

Ambulance placements were consistently described as the most important and motivating learning environment for developing a NotSan identity. They offered direct exposure to the profession, contact with patients, and participation in real emergency situations. Trainees reported that gradually increasing responsibility and being entrusted with tasks made them *“feel more like a NotSan.”* (P10). Observing experienced colleagues in action and receiving feedback on their own performance supported both skills acquisition and PIF.

Mentors and clinical instructors (CIs) played a central role when they combined strong theoretical knowledge and practical experience with a calm, supportive manner and an ability to step back rather than micromanage. These placements enabled deliberate practice and identity-relevant feedback. However, several trainees noted that, despite CIs being a mandatory component of training regulations, contact with designated instructors was sometimes minimal or absent, *“sometimes people don’t even know who their clinical instructor is.”* (P10). To maximise the potential positive impact of ambulance placements, participants emphasised the importance of reliable access to engaged CIs and structured feedback.

### **Hospital Placements**

In contrast, hospital placements were described as the greatest barrier to PIF. Nine interview participants made a total of 47 negative comments about their hospital experiences. The main issues were unclear expectations, limited meaningful learning opportunities, and a

lack of understanding of the NotSan role among other healthcare professionals (HCPs). One trainee remarked, *“I’ve heard all sorts of titles in the hospital during my practical training, ranging from ‘Rettungssanitäter’ (EMT) to ‘Notfallrettungsassistenten-Sanitäter’ (emergency EMT paramedic). It’s unbelievable how difficult it seems for them to remember a job title. This reflects a lack of respect.”* (P15).

Hospital staff often lacked awareness of NotSan competencies, so trainees were assigned tasks unrelated to their future role or left without structured supervision. This resulted in a high number of unproductive hours, role confusion, and feelings of being undervalued. One participant described unrealistic training expectations, *“at the end of my training, I have to prove that I have performed 40 cardioversions!”* (P15). Another reported, *“my very first hospital block was the nursing internship... and I was about to quit because I didn’t want to do it anymore. It was a psychological strain because you went to work crying and came home from work crying because you felt so badly treated.”* (P14). A further comment raised concerns about trainees *“secretly calling in sick... or... not telling anyone and then signing everything themselves.”* (P15).

Participants proposed clearer learning objectives, designated CIs who understand the NotSan role, and better information for hospital staff about NotSan competencies as key changes that could turn hospital placements into a more supportive environment.

## Role Salience

The survey did not show statistical differences in MCPIS-9 scores by training institution. However, interview data suggested that role salience can vary for trainees who hold dual roles, such as those serving as both firefighters and NotSan. In one region, a participant reported, *“every firefighter is also a NotSan, so there are no firefighters who don’t drive ambulances, and you often notice that these people have no interest in emergency services whatsoever. They just want to put out fires... When they ring the doorbell, they don’t say, ‘Hello, this is the ambulance service.’ They say, ‘Hello, this is the fire brigade.’ So, they’re probably not in the right place in the EMS.”* (P1).

Another participant described a more flexible experience, *“in my experience, that works well, actually, as soon as you put on the yellow trousers in the EMS, you’re part of the EMS, as soon as you put on the blue trousers, in the fire service.”* (P7). These contrasting accounts illustrate how local cultures and personal career goals may influence which role becomes most salient.

In dual-role contexts, trainees highlighted the need for clearer organisational messaging about expectations in EMS versus fire service roles to reduce role conflict and support a stronger NotSan identity.

## Discussion

This study shows that the MCPIS-9 scale is a reliable and valid tool for measuring PI among NotSan trainees in German VET programmes. The average score of 38.13 out of 45 is similar to results from Australian paramedic students and German medical students, suggesting that

NotSan trainees usually develop a strong PI during training (Johnston & Bilton, 2020; Faihs et al., 2023).

Several patterns in the quantitative data deserve attention. PI scores did not improve across training years ( $r = -0.097$ ,  $p = 0.161$ ), suggesting that current VET structures may not systematically strengthen PI as trainees progress. Gender did not significantly predict PI scores, indicating that identity formation in this cohort is shaped more by learning environment than by demographic factors. Finally, because the majority of respondents ( $n = 263$ ) were qualified RettSans, the sample may over-represent trainees with prior EMS experience and established commitment to the field, potentially inflating overall PI scores.

The link between higher MCPIS-9 scores and longer intended time in the job ( $F(5,371) = 12.264$ ,  $p < 0.001$ ,  $\omega^2 = 0.130$ ) suggests that PIF is not only an important educational outcome, but may also support workforce retention. The slightly lower rates of trainees planning to leave EMS within five years may indicate that those with stronger PI were more willing to take part in research. As highlighted in early work, planned job longevity is also likely shaped by structural deficits and limited career or development opportunities in the German EMS system (Elsenbast, 2024; Lehweß-Litzmann & Hofmann, 2022).

Interview participants showed a growth mindset, complementing findings from other HCP research that connects growth mindset and PI (Andrianov et al., 2022; Lane & Roberts, 2021; Zarrinabadi et al., 2023). Actively teaching growth mindset in NotSan training could therefore be a useful way to strengthen PIF and resilience.

Using RIT, the findings underline the importance of identity verification in real practice settings. Ambulance placements gave trainees meaningful responsibility, role enactment, and positive feedback, leading to strong identity confirmation (for example, feeling “more like a NotSan”). In contrast, hospital placements often led to negative identity verification, as other professionals’ poor understanding of the NotSan role, inconsistent supervision, and unrealistic expectations weakened trainees’ sense of professional legitimacy. This mirrors German findings that hospitals are the least satisfactory learning environment for NotSan, whereas EMS stations and schools are rated more positively (Elsenbast et al., 2024), although it is also possible that trainees’ negative experiences reflect the inherently unfamiliar nature of hospital settings rather than a structural deficit in identity support alone.

The results mirror existing concerns that cooperation between VET schools, EMS providers, and hospitals is often weak (Grow, 2020; Grusnick & Tarquinio, 2020). They confirm that many HCPs still have only a limited understanding of the NotSan role, with potentially harmful effects on trainees, including thoughts of quitting (Klanetschen & Benner, 2025; Lehweß-Litzmann & Hofmann, 2022). Where CIs were clearly engaged and communication between institutions worked well, trainees reported better learning and stronger identity development. Where this support was missing, they felt isolated and sometimes used coping strategies that could undermine both learning and integrity, which suggests that better collaboration, clearer expectations, and access to knowledgeable role models are essential for healthy PIF.

Trainees face not only negative identity verification from other HCPs, but also role conflict inside the EMS. The fragmented German EMS system leads to different expectations of NotSan practice between regions (Holbe, 2024). While VET schools teach to national standards and support PIF through theoretical subjects, local and state-level rules can conflict with these standards. Trainees must integrate divergent and sometimes opposing views of their profession into their role identity (“we rarely see that being applied out on the streets”). RIT suggests that such disruptions, especially when support is lacking, can slow or even reverse identity development.

Alongside these barriers to identity verification, findings point to promising educational tools that could support positive role enactment. If educators can identify role conflict early and offer concrete tools such as growth-mindset training, trainees may be better equipped to manage the emotional challenges of PIF and develop a more resilient NotSan identity (Cleven et al., 2023). Interviewees’ requests for more communication and conflict management training correspond with the wide spread of MCPIS-9 scores (range 18–45), indicating that trainees who lack these non-clinical skills may be among those reporting the lowest PI levels.

Developing both a growth mindset and strong communication skills may strengthen role salience and help new graduates enter the workforce with higher professionalism. In turn, this can advance paramedicine by raising standards and expectations (Lazarsfeld-Jensen, 2014) and indicates that targeted educational strategies can strengthen PI, improve workplace culture, and support workforce retention.

A further strategy emerges from comparing hospital challenges with more positive ambulance experiences. Trainees described greater support from CIs during ambulance placements, which likely improved their satisfaction with this learning environment (Garratt, 2021). High-quality mentorship is crucial for modelling professional standards and supporting trainee success (Prescher et al., 2020). Therefore, better access to CIs, stronger cooperation between learning sites, supportive educational settings, and inter-professional learning opportunities appear essential for nurturing PIF and ensuring high-quality NotSan training (Flobakk-Sitter & Ballo, 2025).

### Limitations

Participation in both the survey and interviews was voluntary. Trainees with especially strong or especially negative views of their PI may have been more likely to take part, limiting the representativeness of the findings. In addition, the over-representation of RettSans in the sample limits generalisability to NotSan trainees without prior EMS experience.

The small qualitative sample ( $n = 15$ ) and heterogeneity of VET structures across German states prevented data saturation and limited regional transferability. As a cross-sectional study, it cannot establish trajectories or causal relationships in PI development.

Additionally, as only separate univariate ANOVAs were conducted, and the study did not use multivariable regression or other methods to account for potential confounding between background variables, the observed associations should be interpreted as exploratory.

### Conclusion for Practice

Overall, trainees reported medium-to-high PI scores with a broad range, and their accounts highlighted important gaps in how current training structures support identity formation.

To strengthen PIF among NotSan trainees, educational institutions should prioritise the following recommendations:

- Ensure clinical instructor requirements are met across all training environments, particularly in hospitals
- Develop interprofessional training sessions to educate hospital staff about NotSan roles, responsibilities, and competencies
- Create clearer, more achievable learning objectives for hospital placements
- Expand non-clinical skills training, particularly in communication and conflict management.

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### **Ethics vote:**

The study described was conducted by the Ethics Committee German Society for Paramedic Science e.V. (DGRe) under the registration number DGRE\_BEth\_13\_24 and in accordance with its ethical principles. This was noted by the University of Limerick EHS REC ethics committee (Reference No: 2025\_02\_07\_EHS (OA)).

### **Conflict of interest:**

Trisha Morrissey is a member of German Society for Paramedic Science e.V. The authors have no other competing interests to declare.

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