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Learning the Ropes of Strategy: How Ambiguity Shapes Role Transitions in Problem-based Strategy Education

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Strategy education has faced enduring criticism over the last decades. Experiential approaches like problem-based learning offer a promising pathway for strategy education by immersing students in the ambiguities of strategy work. Following Merton, we argue that experiential learning in higher education is not just about the acquisition of knowledge and skills, but ultimately about inhabiting new professional roles. In this sense, the strategy classroom becomes a site of transition: students learn not only about strategy and its analysis, but what it feels like to act as a strategist. This paper examines how ambiguity in problem-based strategy education shapes students' role transitioning and learning outcomes. Drawing on qualitative data from a post-graduate strategy course, we find that students experienced a sequence of unfolding ambiguity types ('entry ambiguity', 'content ambiguity' and 'outcome ambiguity') that closely mirror the ambiguities of real-world strategy work. The interplay between students' ambiguity experiences and their responses fostered a strong sense of the strategist role by the end of the course. This process was supported by evolving forms of peer collaboration and mentor interventions. We incorporate these findings into a conceptual model, contribute to strategy education literature and offer practical implications for strategy pedagogy.

Introduction

Ambiguity is widely recognized as a central feature of strategy work (Cappellaro, Compagni and Vaara, 2021). While ambiguity may be created deliberately to accommodate multiple interests in strategy (Jalonen, Schildt and Vaara, 2018), it is also manifest in the inherent uncertainty and complexity of strategic and organizational decision-making (March, 1978). Additionally, ambiguity arises due to the elusive nature of the strategy role itself (Whittington, 2019). Unlike other organizational roles, such as accountants or marketers, strategy often lacks clear role expectations that would help actors to learn 'the ropes' of strategy-making (Plotnikova, Brielmaier and Friesl, 2025). While strategy literature has extensively explored how ambiguity shapes strategy practice, its role and implications for strategy education have received relatively limited attention (Bell *et al.*, 2018; Grant and Baden-Fuller, 2018).

Over the years, there have been enduring calls to innovate the curriculum and pedagogy in management and strategy education (e.g. Christopher, Laasch and Roberts, 2017; Dent and Fearon, 2025; Mason *et al.*, 2024). This prompted pedagogical innovations like design thinking (Schumacher and Mayer, 2018), gamification (Schöbel, Janson and Leimeister, 2023) and others, alongside the traditional case method (Christensen and Carlile, 2009). A common theme in these calls is that strategy education should authentically mirror strategy practice, emphasizing experiential learning over abstract analytical exercises (e.g. Dean, Wright and Forray, 2020; Grant and Baden-Fuller, 2018). Such experiential learning is important, because university-level education is not only about acquiring knowledge and analytical capabilities but also about identity formation. As Sturdy *et al.* (2006, p. 851) note, it involves the 'adoption and enactment of the identity as managers'. In this sense, universities offer spaces where students begin to inhabit professional roles; they become accountants,

physicians or, indeed, strategists (Merton, 1957; Reinsch *et al.*, 2023). The strategy classroom thus becomes a site of transition: students learn not only about strategy and its analysis, but what it feels like to act as a strategist.

Therefore, for strategy education to effectively facilitate such role transitions, it must expose students to the very ambiguity that characterizes strategy work. One particularly promising format for enabling this is problem-based learning (PBL), which confronts students with real-world strategic problems (Mauri and Neiva de Figueiredo, 2025; Ungaretti *et al.*, 2015). In PBL, students work in self-directed groups to tackle complex and ambiguous problems, with the lecturer facilitating rather than prescribing the content and process (Savery, 2015). Yet, while experiential formats like PBL aim to place students in realistic strategic situations and enable transitioning into the strategist role, we still know little about how ambiguity shapes this process. This is all the more important given that strategy education in the modern business school is expected to help students manoeuvre the complexities and paradoxes inherent in strategy-making (Bell *et al.*, 2018). Based on these arguments, we ask: 'How do students experience ambiguity in problem-based strategy education? How does ambiguity impact students' transitions into a strategist role and their learning outcomes?'

To address these research questions, we draw upon extensive qualitative data from two iterations of a problem-based, post-graduate corporate strategy course, designed to resemble strategy practice. In this course, students worked in teams to formulate strategies at the business unit and corporate level. Employing a longitudinal design (Langley, 1999), we trace the experiences of 13 students at different points in time as they transitioned into a strategist role throughout the course. Based on our analysis, we develop a process model that explains how students navigate ambiguity as part of this role transitioning. We find that students experienced a sequence of ambiguity types (entry, content and outcome ambiguity) each of which incorporates different elements of the core ambiguities in real-world strategy work. Students responded to these ambiguities by actively working through them. This process was supported by evolving forms of peer collaboration and mentor interventions, which shifted in function and focus as students increasingly inhabited the strategist role. Our analysis suggests that this engagement with ambiguity over time has important role-level implications (role readiness, role effectiveness and role confidence). We demonstrate that this process enabled two strategic learning outcomes: 'critical strategic thinking' and 'resilience in ambiguity of strategy'.

Our paper makes two main theoretical contributions to the literature on strategy education. First, we offer a dynamic perspective on how students experience and navigate ambiguity in experiential strategy education. Instead of treating ambiguity as monolithic in the learning process (e.g. Crosina *et al.*, 2024; Ungaretti *et al.*, 2015), we identify and unpack different types of ambiguity and show how each of them shapes learning in distinct ways. These types of ambiguity closely mirror the core ambiguities found in real-world strategy work, making PBL approaches particularly well-suited to preparing students for strategic practice. Second, our study advances strategy education research by showing how ambiguity can be purposefully used as a powerful pedagogical tool. While previous research has emphasized that strategy education should help students learn to deal with ambiguity, it has rarely addressed how this can be achieved in practice (e.g. Bell *et al.*, 2018; Grant and Baden-Fuller, 2018). We show that navigating ambiguity contributes to two key learning outcomes: 'critical strategic thinking' and 'resilience in ambiguity of strategy'. Achieving these outcomes requires an evolving role of the lecturer who must shift from providing psychological safety early on to offering contingency-reducing guidance.

Theoretical background

Ambiguity: A key characteristic of strategy work

Strategy research widely emphasizes ambiguity as a central feature of strategy practice (e.g. Cappellaro, Compagni and Vaara, 2021; Knight *et al.*, 2025). Ambiguity is broadly defined as 'a lack of clarity regarding a phenomenon or situation', implying 'the presence of multiple, even conflicting, interpretations of the same phenomenon' (Cappellaro *et al.*, 2023, p. 1). Building on recent conceptualizations (Cappellaro *et al.*, 2023), three complementary forms of ambiguity in strategy can be distinguished: strategic, intrinsic and role-related ambiguity.

The strategic perspective illuminates how ambiguity is purposefully used within organizations as a form of communicative strategic action (Eisenberg, 1984; Sillince, Jarzabkowski and Shaw, 2012). Ambiguity around strategic concepts can legitimize change by appealing to diverse stakeholders, but may later complicate implementation (Abdallah and Langley, 2014; Jalonen, Schildt and Vaara, 2018).

Rather than being deliberately constructed, intrinsic ambiguity arises due to the inherent uncertainty and complexity of strategic decision-making (March, 1978, 1994). It emerges from incomplete or conflicting information (Gavetti and Rivkin, 2007) unclear or competing goals (Levinthal and Rerup, 2021), or difficulties in interpreting dynamic market environments (Vuori and Tushman, 2024).

Finally, role-related ambiguity is distinct from, yet connected to, the ambiguity arising from the intrinsic conditions of strategic decision-making. It concerns

the ambiguous nature of the strategist role itself (Plotnikova, Brielmaier and Friesl, 2025; Whittington, Cailluet and Yakis-Douglas, 2011). Unlike readily recognizable roles, such as those of a priest or surgeon (Abbott, 1988), strategy work is ill-defined. It lacks widely shared expectations of how a strategist role is supposed be performed (Mantere and Whittington, 2021; Whittington, 2019). Consequently, it is challenging for individuals to enter and learn how to enact the strategist role (Plotnikova, Brielmaier and Friesl, 2025).

Despite its centrality in practice, ambiguity remains underexplored and underappreciated in strategy education (Bell *et al.*, 2018). Classic strategy education has predominantly followed an analytic path. For instance, Porter (1980) emphasized strategic analyses as the cornerstone of strategy education, as they would help future managers comprehend complex strategic situations (Grant, 2008, 2021). Historically, case studies formed the foundation of such strategy education, offering a structured way to explore strategic problems and facilitate strategic analysis (Albert and Grzeda, 2015; Christensen and Carlile, 2009).

While analytical approaches are still widely used across business schools, and for good reason, they have also attracted sustained criticism (e.g. Anderson *et al.*, 2018; Hrenyk and Salmon, 2024). Critiques converge on a shared concern: The focus on strategic analysis, often based on 'homogenized' case studies, does not authentically resemble strategy practice. These approaches would overlook social dynamics that shape strategy work (Anderson *et al.*, 2025; Jarzabkowski and Whittington, 2008) and promote a narrow, shareholder-oriented perspective that sidelines societal considerations and the complexities they introduce (Bridgman, Cummings and McLaughlin, 2016; Edwards and Küpers, 2024). As a result, such approaches to strategy education risk presenting students with a rather 'sterile' view of strategy and its role (e.g. Albert and Grzeda, 2015; Dent and Fearon, 2025; Mintzberg, 2004). And indeed, while analytical approaches such as the case study method allow students to experience some form of intrinsic ambiguity like incomplete or conflicting information, they do little to expose learners to strategic or role-related ambiguity.

In response, there have been repeated calls to innovate management and strategy education and better prepare students for their future roles (Christopher, Laasch and Roberts, 2017; Mason *et al.*, 2024). But how might such a pedagogical approach look like?

Ambiguity and role transitions in problem-based strategy education

Experiential approaches offer a promising pathway for management and strategy education (e.g. Dean, Wright and Forray, 2020; Garvin, 2007; Grant and Baden-Fuller, 2018). Following Merton (1957), we argue that experiential learning in higher education is not just about the acquisition of knowledge and skills, but ultimately about transitioning into new professional roles. For instance, by studying medicine, students begin to become physicians (Reinsch *et al.*, 2023). Similarly, by engaging with 'strategy' as a distinct form of managerial work, students begin to take on the role of strategists; they learn not only what strategists do, but what it feels like to be one (Mantere and Whittington, 2021). Empirical research on management education, particularly in the context of MBA programs, supports this view: students engage in identity work and begin to inhabit managerial roles (e.g. Sturdy *et al.*, 2006; Warhurst, 2011). For this transition to occur meaningfully, strategy education must reflect the core characteristics of strategy practice. Since ambiguity is a defining feature of strategy work, engaging with it becomes critical to inhabiting the strategist role.

Among other experiential learning approaches like design thinking (Schumacher and Mayer, 2018) and action learning (Brook and Pedler, 2020), PBL has been recognized suitable for management and strategy education (Ungaretti *et al.*, 2015). Rooted in Dewey's pragmatist pedagogy (Thomassen and Jørgensen, 2021), PBL confronts students with complex and ill-structured real-world problems and empowers them to take a self-directed role in finding solutions (Barrows, 1996; Savery, 2015). The PBL learning cycle begins with a problem, followed by collaborative problem-solving and concludes with presenting and reflecting on the solution (Hmelo-Silver, 2004). In strategy education, ambiguity in its different forms—strategic, intrinsic and role-related ambiguity—is likely to be integral to this process. Students encounter strategic ambiguity when they develop shared solutions without a unified understanding of what the strategy should achieve, requiring them to actively reconcile multiple interpretations (e.g. Awati and Nikolova, 2022). They face intrinsic ambiguity in the inevitable messiness of gathering and evaluating the 'right' information amid incomplete data (e.g. Cho and Cho and Cho *et al.*, 2021). At the same time, they experience role-related ambiguity as they step into the strategist role, without clear expectations how a strategist should act (e.g. Plotnikova, Brielmaier and Friesl, 2025). In mirroring the conditions of real-world strategy, PBL enables role transitioning: it helps students move from learning about strategy to learning how to be a strategist.

Although increasingly used experiential approaches such as PBL are designed to resemble strategy practice and engage students in enacting the strategist role, we know little about how they experience the ambiguity inherent in this process and how it shapes their transitioning into this role. Based on these arguments, we ask the following research questions: 'How do students

experience ambiguity in problem-based strategy education? How does ambiguity impact students' transitions into a strategist role and their learning outcomes?'

Methodology

We drew on a qualitative longitudinal design based on a master-level elective strategy course at a German university (Langley, 1999; Langley *et al.*, 2013) to explore how students experience ambiguity in problem-based strategy education and how it shapes their transition into a strategist role over time. The course was designed based on PBL principles (Ungaretti *et al.*, 2015). In line with our longitudinal design and prior work in management education that traces individual learning experiences and their dynamics over time (e.g. O'Flanagan and Jester, 2025; Petriglieri, Wood and Petriglieri, 2011), we closely followed 13 students across 2 course iterations during the summer semesters of 2023 and 2024. Our research design is well-suited for theory building. As Ozcan, Han and Graebner (2017) emphasize, longitudinal approaches with key informants are particularly powerful for theorizing when they provide access to underexplored phenomena. Our exploration of students' experiences over time promises novel insights into experiential learning processes that have received limited attention in strategy education.

Research context: Strategy course design and structure

The strategy course was co-developed with an education expert and two senior managers to reflect the complexity of real-world strategy work. Both managers confirmed that it closely mirrored strategic practices in their organizations. Development was further supported by funding from the German government for innovations in higher education. This funding initiative promotes novel and authentic approaches to strategy teaching aimed at better preparing students for future roles as strategists and managers. In the course, students represent the top managers of a company (key business units and corporate parent). As deliverable, students are tasked to solve the strategic problem of developing a new strategy that would be comprised of strategies for each business unit and a unifying corporate-level strategy. The first iteration focused on Bayer AG, the second on Volkswagen Group, both facing substantial strategic challenges.

Rather than drawing on lectures, PBL was enacted as a role-play format over about 8 weeks. The course content and outcomes were developed by the students. While students self-organized and were responsible for their contributions, they were still guided by predetermined milestones and received advice from the lecturer. These milestones were enacted as 'press conferences', in which students collaboratively discussed their progress. Throughout the process, the lecturer assumed different roles. He acted as a consultant, giving advice wherever needed. This role was assumed during fixed sessions where all teams worked on their strategies in the classroom and in several pre-defined feedback meetings with the teams. Furthermore, during the press conferences mentioned above, he assumed the role of the business press, asking critical but guiding questions. These press conferences were summarized by the lecturer in weekly 'newspaper' articles that reflected on students' progress. Finally, to capture their learning process, students were asked to keep a voluntary diary, which should form the basis for the second piece of assessment; an individual reflective essay.

Data collection

The study and its data collection were conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Participation in the interviews and focus group was fully voluntary and based on informed consent. To avoid conflicts of interest, interviews were conducted by members of the research team who were not responsible for grading or delivering the course. We had access to a broad range of course-related materials, including introductory presentations, students' final presentations, reflective essays and 13 voluntary student diaries. For the purpose of this study, the exploration of how individual students experience and navigate ambiguity in problem-based strategy education, we focused on two key data sources:

Semi-structured interviews. The main data source of this paper is $N = 47$ in-depth semi-structured interviews at four different points in time. In total, 13 students of both iterations of the course participated in this study. This represents ~30% of all enrolled students (45 students across both years). We aimed for a balanced sample in terms of age and gender. The average age of all course participants was 25 years, which matched the average age of the interviewed students. Among all course participants, 60% identified as female and 40% as male; among the interviewees, the gender distribution was 54% female and 46% male. All interviews except one (and the focus group, see below) were conducted in German. To ensure accuracy, the translation of selected quotes was carefully cross-checked by the first and second authors.

As the course structure and design remained consistent, the interview guides were similar but also evolved across the two iterations. Interviews in the first iteration (four students) were exploratory and provided a foundation for refining and expanding the questions in the second course iteration (nine students). Specifically, the second iteration placed greater emphasis on how students were able to deal with the ambiguity they encountered.

Table 1. Overview about conducted student interviews

Student	Course term	Interviews	Date of interview
S1	Summer semester 2024	Interview 1	May 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S2	Summer semester 2024	Interview 1	April 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S3	Summer semester 2024	Interview 1	April 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S4	Summer semester 2024	Interview 1	May 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S5	Summer semester 2024	Interview 1	April 2024
		Interview 2	June 2024
		Interview 3	July 2024
S6	Summer semester 2024	Interview 1	April 2024
		Interview 2	June 2024
		Interview 3	July 2024
S7	Summer semester 2024	Interview 1	May 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S8	Summer semester 2024	Interview 1	April 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S9	Summer semester 2024	Interview 1	May 2024
		Interview 2	June 2024
		Interview 3	July 2024
		Interview 4	Aug. 2024
S10	Summer semester 2023	Interview 1	April 2023
		Interview 2	June 2023
S11	Summer semester 2023	Interview 1	April 2023
		Interview 2	June 2023
		Interview 3	Aug. 2023
		Interview 4	Nov. 2023
S12	Summer semester 2023	Interview 1	April 2023
		Interview 2	June 2023
		Interview 3	Nov. 2023
S13	Summer semester 2023	Interview 1	April 2023
		Interview 2	June 2023
		Interview 3	Aug. 2023
		Interview 4	Dez. 2023
		Σ 47 Interviews	

In line with the principles of longitudinal qualitative research (Langley *et al.*, 2013), interviews were conducted at different key stages of the course (see Table 1). The initial interviews were conducted at the beginning of the course (end of April). Within these interviews, we investigated the students' expectations, concerns and initial thoughts about the course. To gain deeper insights as the course unfolded, we conducted another round of interviews in the middle of the semester (beginning of June). Further interviews were conducted at the end of the semester, just before or shortly after the final presentations. Some students asked to conduct the interviews after the presentation due to the workload they faced (beginning of August). The final reflective interviews were all collected after the course was completed.

Focus group. To explore the resonance and robustness of our findings and conceptual model (Figure 1), we conducted a 1-hour focus group in June 2025 with three students from the second course iteration who had not participated in interviews. After informed consent, the

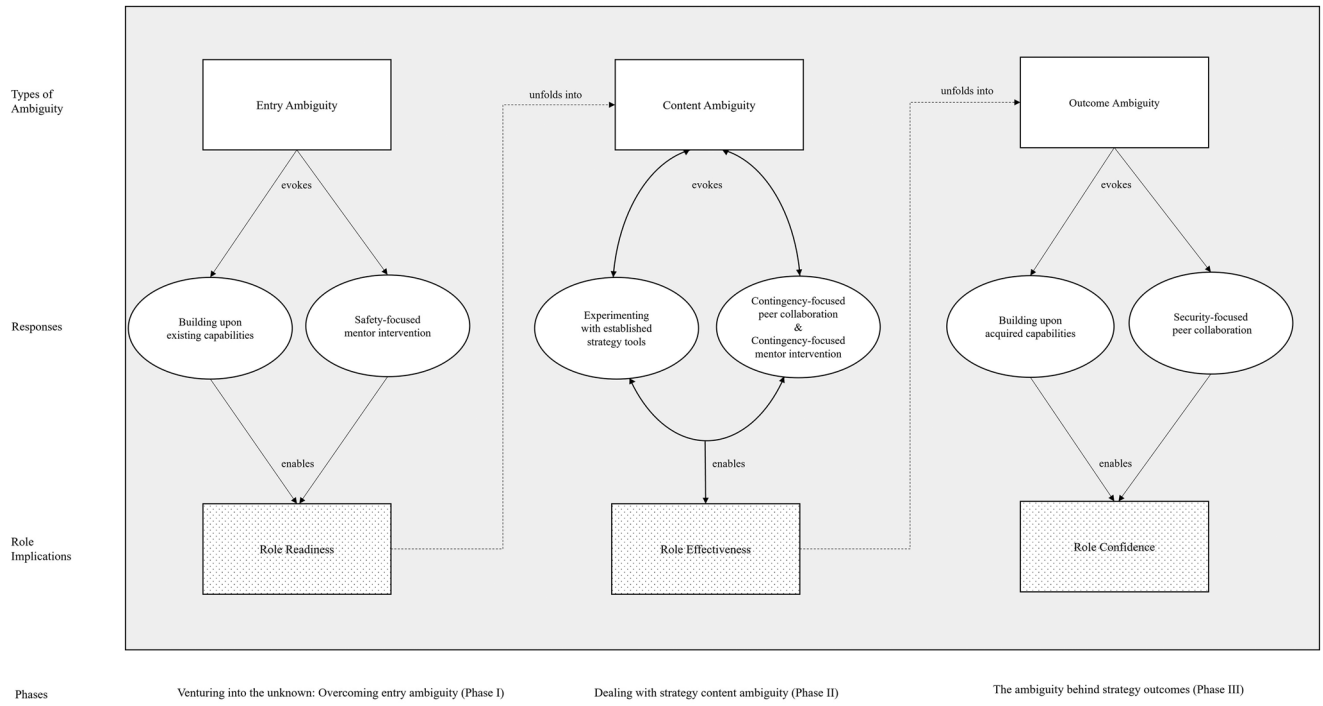

Figure 1. A process model of ambiguity and role transitioning in problem-based strategy education

discussion was structured in two parts: reflections on the course experience (e.g. realism, ambiguity types) and critical engagement with our conceptual model.

Data analysis

To develop new theory in problem-based strategy education, our analysis unfolded through the constant interplay of inductive as well as deductive forms of analysis (Shepherd and Sutcliffe, 2011). Tables 2 and 3 provide supporting evidence for all conceptual second-order themes. Our analysis followed six interrelated steps:

First, we compiled student-specific, chronological data sets based on all data sources (Langley, 1999). We chose to focus on the second iteration of the course, while the first iteration served to ensure the trustworthiness of our analysis (see step 5). The first two authors immersed themselves in the interview data and openly coded the data (Miles and Huberman, 1994). Early on, two strands of themes emerged: on the one hand, ambiguity played a key role in students' learning experience, and on the other hand, the learning experience seemed to take the form of a role transition. The former was evident in first-order descriptive themes such as 'excitement and insecurity about students' active role' or 'ambiguity regarding the correct use of information', while the latter appeared in themes like 'initial engagement with strategy tools' or 'lack of confidence in performing strategy tasks'. Based on these early insights, we engaged with the literature on ambiguity in strategy yet also with research on role transitions.

Second, we re-engaged with the empirical material but now our analysis was informed by existing notions of ambiguity (Cappellaro *et al.*, 2023) as well as role-transitions (Ashforth, 2001). We organized first-order themes chronologically, corresponding to the timing of the interviews. Comparing themes within and across different points in time, we observed that the focus of ambiguity shifted significantly over the course. In several iterations, we assigned abstract theoretical second-order codes that capture the essence of similar first-order descriptive themes (Miles and Huberman, 1994), leading to three evolving types of ambiguity: 'entry ambiguity', 'content ambiguity' and 'outcome ambiguity'. Moreover, we also examined how students dealt with these types of ambiguity, following a similar open-coding approach. Emerging themes included 'drawing on prior work experience' or 'perceived safety due to lecturer's support'. Comparing these themes within and across the different points in time, we identified patterns and labelled the second-order conceptual themes as 'responses'. These include 'safety-focused mentor intervention' and 'contingency-focused mentor intervention'.

Third, informed by existing role theory concepts, such as 'role entry' and 'role performance'(Ashforth, 2001; Plotnikova, Brielmaier and Friesl, 2025), we examined how the identified responses shaped students' progression in their role transition. We realized that the responses identified in step 2 had different effects at different points in time. While initial responses en-

Table 2. Supporting evidence: Types of ambiguity and responses

Phase I		
Entry ambiguity	Building upon existing capabilities enables role readiness	Safety-focused mentor support enables role readiness
Additional evidence iteration II		
Oh, at first, I was completely shocked. Really shocked. I thought to myself, "Oh God, what is happening here?" […]. But when the entire course program was introduced, it became clear that, okay, we are in groups. The groups are more or less left to themselves at some point. (S3, I1)	I think I am actually quite good at teaming up with other people, in this case, other students, and working on something together. When I think back to my work experience in the two years before starting my master's program, that was what I enjoyed the most, collaborating with colleagues in a team or in a project team. It always worked out well, and there were never really any personal conflicts. So, the teamwork always went well. So I think it will work out well here, too! (S6, I1)	I think we have an active role, freedom, and we have the knowledge that we can have support, that whenever we want, we can get help from our professor […]. It makes me feel self-confident [for the course]. (S5, I1)
I thought to myself, kind of exciting because it's a completely different concept, it's not a traditional lecture or a seminar, like the ones we are used to. Instead, we have to do more of a learning-by-doing approach. And I was already thinking, okay, I can really not imagine how exactly this is going to play out. (S8, I1)	I see my role as trying to bring my perspective into the the course […]. My perspective comes from being a car enthusiast who knows the industry quite well and engages with it a lot. This impression is reinforced by conversations I had with other people in the course who are less involved in the automotive field. I feel this is an area where I can contribute something valuable. (S2, I1)	I do think that you can probably manage the challenges quite well, especially because you are not alone […] since professor [name] sometimes can support when there are problems […] I think that really helps. (S7, I1)
I think during the first session, it was mystery for me regarding what would happen. Always in the courses the professor would say something, we would take notes, and then go home. Maybe if we wanted to be good students, we would review the material before the next session. However, this course is different. (S5, I1)		You can tell on a personal level that Professor […] is a normal person and enjoys interacting with people. The same applies to you [interviewer]. That means there is no need to be afraid [of what is to come in the course]. (S9, I1)
Confirming evidence iteration I		
I am looking forward to it. At the same time, of course, there is also uncertainty. I mean, that is like the goal of the course, to put us in a situation where we first have to find our own way and do not yet know exactly where the project is going. This can be especially overwhelming initially for people who prefer structure, like myself. (S10, I1)	At first, you stand there a bit like a deer in headlights, having no idea what exactly needs to be done. Of course, that feels uncomfortable at first because you are simply not used to it if you're only used to traditional lectures. But personally, I have to say that in the next moment, I also thought: "Awesome." Because I have already worked in an entrepreneurial setting, I have developed a certain approach. And I feel that I have a certain skill set [that helps for the course]. (S13, I1)	I am looking into the future [regarding the module] with a positive attitude. The professor gives us a good sense of reassurance and keeps telling us that even if things do not make sense right now, by the end of the working period, everything will come together, and we will know where we stand and that we have worked out something. That gives me a very positive feeling, otherwise, I might be a bit more anxious about it. (S10, I1)
Phase II		
Content ambiguity	Experimenting with established strategy tools enables role effectiveness.	Contingency-focused peer collaboration and mentor intervention enables role effectiveness

Table 2. (Continued)

Phase I		
Entry ambiguity	Building upon existing capabilities enables role readiness	Safety-focused mentor support enables role readiness
Additional evidence iteration II		
There are some struggles [regarding the strategy content] because it is not clear what a strategic issue actually is. Because we also do not know how the future looks. Really who knows what happens in one week or two? (S1, I1)	If, for example, there was uncertainty about which analysis to conduct or which [strategy] tool to use, then we just took about half an hour to try something out. Just experiment a bit and see what comes of it. Does it make sense? Is it helpful for us? And then, after trying out three or four tools, decide which one we want to use more concretely. Something like that. In general, it was always about experimenting a little. (S4, I2)	Contingency-focused peer collaboration: I would say, especially thanks to my group, we are handling the challenges quite well. If one of us was unsure about a topic or initially thought, "Did I understand this correctly?" we discussed it together in the group and helped each other out. […]. Everything is a bit uncertain [still], because we have so many analyses […] but I think that will definitely sort itself out. I feel it is well-organized, and I can rely on my group. I am really thinking, it will work out (S8, I2).
We face a problem, that has not been clearly defined. At the beginning, we did not even know: What is our strategic issue? We had to figure that out on our own. And that is quite different from other courses we had. In other group projects, it is often very clear from the start: you need to work on this and that as a group and present it in this specific way. But in this course, that is not the case at all. I think that makes it much more practical and realistic because […] when you need to develop a strategy or address other problems, you often do not know what the scope of the problem is, how to define it, or what the best solutions may be. (S6, I2)	At the beginning, I was like, "Oh God, can I even manage this? Will I find everything that's relevant?" and so on. But then, we handled it by dividing the tasks. For example, one person tries the PESTEL analysis, another the VRIO analysis, and so on. Once we divided the tasks, everyone did their research individually during the week. (S3, I2)	Contingency-focused mentor intervention: I think it is really great how he [mentor] does it. He never told us what we should do or which direction we should take, but we always understood what he meant and where we were supposed to go. He never said it directly but always supported a bit when we were unclear about the direction to take (S1, I2).
Confirming evidence iteration I		
There is just very little information available. For example, we are currently evaluating to what extent a sale, a spin-off, or the creation of synergies would be beneficial. But you can hardly find anything on how to assess the whole situation […]. For instance, I am currently looking into synergies between [two business units]. And, yes, you can barely find anything on synergies there or on how the two divisions collaborate. That makes it really difficult to determine to what extent the whole situation can be evaluated, and so on. (S11, I2)	But basically, the way we work is that everyone somehow does their own [strategic] analyses [SWOT, BCG], and we can do it quite independently, […] that we really let ourselves go, so to speak, in the analysis. (S10, I2)	Contingency-focused peer collaboration and mentor intervention: So, retrospectively, definitely positive, due to the fact that the uncertainty we had in the first sessions, because we did not exactly know what the course was about and how it would develop, was resolved very well, as a very positive collaboration took place […].Today, we will have the final feedback session with the professor regarding the final strategy presentation next week. So, in that regard, very positive, because I think, okay, we already have a lot. He will be able to give us feedback on everything. We will get a good sense of what we should emphasize, what we should focus on, and where something might be missing [in our analysis]. (S13, I2)
	Current status: Yes, we are making good progress with our analyses. We are working on Future Bayer, and we have conducted a Scenario analysis, were we evaluated our different options. That worked quite well, I would say (S11, I2).	

Table 2. (Continued)

Phase I		
Entry ambiguity	Building upon existing capabilities enables role readiness	Safety-focused mentor support enables role readiness
Phase III		
Outcome ambiguity	Building upon acquired capabilities enables role confidence	Security-focused peer support enables role confidence.
Additional evidence iteration II		
It is more about uncertainty, because we were not sure if what you had researched or found is enough. Can I even incorporate all of it into what I have planned? […] But I think, at the moment, there is still a bit of concern about what really needs to be included. Do I perhaps have too much input that I want to incorporate [for the final presentation]? And then it is always about quantity over quality, and so on and so forth. So, let us see how it develops today. (S3, I3)	I did not really feel [like] an analytical person. That is why I found it a valuable learning experience. Especially things like, I do not know, Porter's Five Forces or the VRIO framework or all the other things we did. A lot of analyses, really. When I hear "analysis," I always immediately think of numbers and data. Well, let us say numbers. But that you do a lot of research […] is not at all what I would think of as analysis. But it is something I can actually do. I was always like, "Numbers are not my thing. Analyses like that are not for me." But these kinds of analyses? I could absolutely do them […] I can also trust myself in doing that. (S9, I3).	I think teamwork, group work, is something I have already mentioned a few times as being a challenge. […] But I was I am lucky with the group. I mean, it is always a prerequisite [to deliver a successful outcome] […].We've had constructive discussions, divided the various tasks in a reasonable, fair, and efficient way, and we could rely on each other. (S6, I3)
[…] this presentation was in sight. And it was somehow still ominous what should go in there and how it was supposed to go. (S6, I3)	If you actually sit, for example, in [a] strategy department and it really matters, you have to deal with this same uncertainty. And somehow, well, of course, it has been quite uncomfortable at times [particularly at the end], but it will not be any different in the future! (S8, I3)	Our presentation was supposed to be 20 or 15 minutes. That was definitely a challenge for us. But then, it turned into really good teamwork, where we noticed that everyone made their part shorter, and our group work really paid off […]. We practiced it two or three days. We met up, always with the presenter, "Thank you, team, thank you, [team member] and we kept presenting. Then we discussed together what worked and what not. We talked it through, adjusted the presentation, and practiced again. That helped us [to feel confident]." (S1, I4)
Confirming evidence iteration I		
So, at the beginning, the uncertainty was really high because we had no idea where we were supposed to go or what exactly we were supposed to come up with. That was not there anymore then. It gradually got less and less, things became clearer, and that [entry and content] uncertainty decreased. Of course, new uncertainties came up instead […]. The insecurity regarding the presentation, or what we shall deliver […] (S12, I4).	So, what I learned and what I applied is that when you present something or have to defend and sell an idea somewhere else, you really have to prepare well and work it out in detail, backing it up with arguments. And then, during the presentation, you need to fully stand behind it, go all in, and be totally convinced of what you are presenting. You have to be able to represent your opinion well and defend it when it really matters, like in an exam situation. You should also be able to answer follow-up questions, even on the spot. […]. You had to be really confident in the subject, not just have superficial factual knowledge. (S11, I4)	I think we just, well, yeah, you have to work, you have to put in the effort [as a team], and then things eventually become clear. And that was the approach I had, and I think we had in the group as well. Working together in a structured way. Structured work in the group was what worked best. That is what made things clear in the end [for the final deliverable]. (S13, I4)

Table 3. Additional evidence: Key strategic learning outcomes

Critical strategic thinking
Interviews:
Yeah, so basically, probably first of all I developed some strategic understanding to some extent. How do you approach something in a structured way? Some analytical skills. (S4, I4)
We worked very freely and independently. And there were also these new or unfamiliar formats, like the press conferences, for example. And because you were taken out of your comfort zone like that, you *reflected more critically on what you had worked out*. And yes, you had a greater learning effect than if you had just, well how should I put it, followed instructions completely or simply memorized something. But in this case, you really worked it out yourself and creatively. And I think that helps you remember things even better. At least I can say that for myself that I really took away an intense experience of what is it like to apply strategic tools [with all the contestations], for example. To even work out a strategic issue, or to present the different options and then present it all coherently, and so on. So yes, I took a lot away from it. (S6, I4)
Yeah, well, I would just say, it's again simply the point about the applying aspect. That we really learned [throughout the course] to apply things right away and not just somehow mindlessly memorize them. So that you kind of don't look at a topic with blinders on, but that you sort of open up your perspective a bit and look at what might be to the right and left, what might also belong to the topic or could be important. (S7, I4)
Focus group:
I would say the biggest learning effect was, first of all, the strategy tools, the ones that are more theoretical and provide a kind of framework and then applying them in practice. But also realizing that you can not always rely solely on those tools. That one single framework isn't necessarily the perfect solution, and that sometimes you have to move beyond such frameworks to find solutions. (Focus Group Participant 3)
Resilience in ambiguity of strategy
Interviews:
Because depending on which industry you end up in, there are of course larger or smaller uncertainties regarding the future or the environmental conditions, which of course can then, yes, maybe harm the business, but maybe also drive it forward! So, I think it's not just the personal uncertainty […] that naturally play a role. Rather, I would now call it general uncertainty that the company is simply faced with. Because, of course, you never know what the future will bring like, for example, the automotive industry. […]. So, I definitely believe that the uncertainty we had […] is also a good experience for the future! (S3, I4)
I mean, that's kind of the core [of the course], in the end, the core of strategy, like, how do you deal with uncertainties? And I think you learn that pretty well, how to deal with it. You are confronted with it, and then you have to somehow find a way out, a solution. Then kind of break it down into decision options, with which you can solve the uncertainty or somehow make it understandable. That's why I think it was definitely a big, important topic [in real life] (S4, I4).
And that's why I also believe that especially these uncertainty factors, [being able] to deal with them, that is also something that really helped me in my learning, for my future professional life and so on. […]. So, because, if I imagine now the [case company] management team or also the [case company] strategy department they're probably not sitting there any differently than we were sitting back in May. I mean, they also, I would say they maybe have a bit more information than we do. But basically, they have similar information available, and they also don't know for sure, like, no one has a crystal ball and can see into the future! And that's why, yeah, I also don't think they are in a different situation than we were, or that we were in a different situation than them (S8, I4)
Focus group:
What I took away from it? I think what I learned most was that we went through how a corporate strategy actually comes about, how the strategists in a company arrive at the decision to pursue one strategy or another. And especially now, looking back after a year, I would say: the future, or future developments, are really hard to predict. That maybe we shouldn't be so afraid of uncertainty, that it is normal for things to be uncertain. And that maybe we should always keep this uncertainty in mind when making strategic decisions. (Focus Group Participant 2)

abled students to become ready for the role, mid-course responses allowed them to act effectively, and final responses enabled them to feel confident in the strategist role. Based on these considerations, we assigned the following labels to these second-order role-level implications: 'role readiness', 'role effectiveness' and 'role confidence' (see Table 2).

Fourth, we further analysed the relationship between the identified second-order themes. Discussing among the author team and returning to our data, we understood that 'role readiness' (Phase I) is the foundation for students to engage in the strategy content that provided another source of ambiguity ('content ambiguity'). Initially, we interpreted students' responses to content ambiguity and their development of role effectiveness as a linear process. However, closer examination, particularly students' accounts, revealed that Phase II unfolded as a cyclical process. Students moved iteratively between ambiguity, experimentation and support, enhancing their role effectiveness. As they became effective in dealing with content ambiguity, a new challenge emerged: the pressure to deliver a coherent and convincing strategy presentation (outcome ambiguity, Phase III). Based on such insights, we developed a process model (see Figure 1).

Fifth, we explored the emerging learning outcomes of the course. We focused on outcomes specifically related to strategy work, rather than more general outcomes expected in PBL such as collaborative skills (e.g. Ungaretti *et al.*, 2015). We again identified several first-order themes and abstracted the most prominent patterns into two second-order themes: 'critical strate-

gic thinking' and 'resilience in ambiguity of strategy' (see Table 3).

Sixth, we drew upon the focus group data to validate our conceptual model and learning outcomes. Although critique was explicitly encouraged, they confirmed that the model closely reflected their experiences, particularly the evolving nature of ambiguity and its implications for role transitions. These confirmations enhance the robustness of our findings and theorization. Appendix A presents illustrative quotes from the focus group, confirming our overall model (A1) and providing additional evidence for each second-order theme (A2).

Role transitions in problem-based strategy education

We demonstrate that students experienced different types of role ambiguity that shaped their learning journey (*Entry Ambiguity*, *Content Ambiguity* and *Outcome Ambiguity*). They responded to these ambiguities by drawing on distinct individual, social and material resources, enabling them to progress through key role development phases (*role readiness*, *role effectiveness* and *role confidence*). Table 2 provides additional evidence for all second-order themes identified.

Venturing into the unknown: Overcoming entry ambiguity (Phase I)

At the beginning of the strategy course, students received a short introductory session from the lecturer. This session provided essential course information and introduced the primary objective of formulating a strategy through a self-directed approach. Key objectives of the course were 'understand approaches to strategic transformation' and apply those 'to real contexts' (introductory session material). Put differently, students were required to assume a strategist role during the course. The initial sessions of the course led to experiences of uncertainty and excitement, which we characterize as 'entry ambiguity'. Below, we examine this type of ambiguity, how students addressed it and its broader implications.

Entry ambiguity. Initial uncertainty about 'what to do exactly' was omnipresent in the course. This uncertainty arose from the shift of responsibilities compared to traditional teaching formats, but also from the inherent ambiguity of strategy itself, as S9 put it: 'How shall we [as students] develop strategy?'. Initially, this shift was experienced as 'shocking' or 'surprising' as students had a taken-for-granted understanding of university-level education:

> At the beginning, I was very […] confused because it is an unusual course. I mean, as a student, including the Bachelor program, you've already had so many regular lectures where, in the very first class, the professor just goes, "Alright, here are the chapters, we'll cover them from A to Z." […] [here] students actually get to shape the direction of the course themselves, I honestly haven't experienced anything like that before. […] I wasn't really prepared for it, but it is a good thing! (S6, I1)

As the quote above also illustrates, initially, students not only experienced feelings of uncertainty, but also excitement to have greater freedom in their learning journey: 'When I wake up, I have so much positive energy to come to university […] because this course is different' (S5, I1).

Building upon existing capabilities enables role readiness. Students overcame the initial entry ambiguity by evoking existing capabilities. Thereby, they introduced experiences of security and familiarity to the novel situation. For example, they drew on their prior work experience and the 'strengths' (S3, I1) they had demonstrated there. This enabled them to feel ready for the strategist role:

> So, it [the course] is open […] we don't know what's coming. And that is obviously not ideal for people who like to have control and know exactly what is happening when and how. But I also think it's actually closer to reality. I see it at my work too. I come up with a great plan for the day, how I will get everything done, and then something unexpected happens. (S9, I1)

Safety-focused mentor intervention. Students not only relied on individual resources to address the entry ambiguity but also found comfort in the climate of trust enabled by the lecturer. This sense of security was deliberately established during the introductory sessions where students were reassured about the availability of regular mentor sessions and their ability to seek guidance whenever needed:

> The professor is one of those teachers who show how much they love what they do. […] For me, that is enough. He is always there; we can always send him emails or talk to him on Tuesdays when we have lectures. (S1, I1)

This supportive and friendly environment helped students to feel ready for the role to play:

> I feel really well supported by Professor [name]. As I said, if anything comes up, I know we can ask him. That is why I deliberately throw myself into situations that are, for me, somewhat uncomfortable. (S8, I1)

Dealing with strategy content ambiguity (Phase II)

In Phase II, students demonstrated an improved understanding of the course structure and what was expected from them. This greater familiarity allowed them to focus their attention on creating strategy content. This was considered challenging due to the elusiveness of

strategy, which introduced a new type of ambiguity we call 'Content Ambiguity'. As we describe below, students engaged in a cyclical process in which content ambiguity, experimentation and interaction with peers and the mentor continuously informed one another, allowing this type of ambiguity to resurface and be re-engaged. Through this process, students developed a sense of effectiveness in the strategist role.

Content ambiguity. Content ambiguity refers to a lack of clarity about the specific material to be used in the learning process. It includes challenges in searching for adequate material and insecurity about whether the chosen approach effectively addresses the strategic problem:

> I feel uncertain right now, but mainly because we are just not entirely sure if what we are doing is enough or if it's correct. And sometimes, you kind of have this feeling of, "What do I know [about strategy]?" (S8, I2)

Content ambiguity was reinforced by the elusive nature of strategy work, allowing for a wide array of options and approaches. Indeed, students highlighted that they faced 'the challenge that a whole world [of strategic issues and options] is open to you' (S4, I2). Engaging with the strategy of the company they represented revealed a countless number of strategic issues. And when they had agreed upon strategic issues, a seemingly endless list of strategic answers emerged:

> What causes the most difficulty is, after defining the key strategic issue […]. There are, of course, countless different approaches. We came up with 50 different [strategic] answers, but obviously, we need a major [strategic] answer to present. (S2, I2)

Experimenting with established strategy tools enables role effectiveness. Students dealt with content ambiguity by experimenting with established strategy frameworks. They provided a starting point amidst the prevailing ambiguity, helping them to come into action:

> So initially, we mainly made some random analysis. Because you always learn about things like the BCG matrix, frameworks, models, and theories in our courses. (S8, I2)

However, while established strategy tools provided valuable guidance in how to get started, content ambiguity soon resurfaced as students realized that all 'these tools can be applied in a different manner and with a different level of detail', leading to 'contested insights' (S6, I2).

Contingency-focused peer collaboration and mentor intervention enable role effectiveness. Drawing on established tools alone was not sufficient to effectively enact a strategist role in the course. To deal with the situation, students leveraged the social support of others, 'discuss[ing] openly about the analyses' (S4, I2). Using established tools became a collective effort, where team members and the lecturer played a critical role in challenging interpretations and narrowing down the multitude of strategic options. The lecturer encouraged students not only to use established tools but also to critically reflect on how to apply them:

> During the last mentoring session with the lecturer, he asked us what we had been working on. […]. I mentioned that we had a SWOT analysis prepared […]. His immediate reaction was, "Oh, oh, but did you properly go through the other things first?" So, that made us [as a team] reflect again […] where do they [analyses] make sense, what purpose do they serve, and what background information is needed to apply them effectively? (S8, I2).

Beyond the guidance provided by the lecturer, students collaborated with their peers to weigh different strategic options and thereby counteract the content ambiguity they faced. Together, these responses—experimentation, peer collaboration and mentoring—formed a dynamic process through which ambiguity was continually revisited and worked through. This interplay enabled students to increasingly act with effectiveness:

> I was not exactly lost, *but I kept wondering*, "Does this [strategic issue] fit? Is it enough?" quite often. But as I said, through the group work, a lot was done cooperatively, with research and additional input being added [by the lecturer]. In the role here currently, I do feel like I have arrived. (S3, I2)

The ambiguity behind strategy outcomes (Phase III)

In Phase III, students felt much more secure about the role they assumed in the course and how to create strategy content. However, they increasingly experienced uncertainty surrounding the result of their pursuits. This particularly applied to the final strategy presentation, where students had to present their results to the lecturer. We term this 'outcome ambiguity'. As we show below, students dealt with this ambiguity by drawing on capabilities acquired throughout the course and by finding security in exchange with their peers.

Outcome ambiguity. During the final weeks of the course, students faced growing insecurity about how their strategic work would be evaluated and whether they could achieve their envisioned outcomes. Students collectively felt 'insecure' as the final presentation approached. This outcome ambiguity was, once again, related to the elusive nature of strategy, offering no clear black-and-white solutions. Students struggled to decide which elements of the vast array of strategic information and analyses to include and what to strategically omit to deliver a convincing presentation:

> We realized that the numbers of [the case company] are really bad. We asked ourselves how to communicate that. So, do you leave it out? Because, I mean, you cannot communicate anything false […]. But do we just pick out a few numbers, leave the rest out, or simply present them

> exactly as they are? […] I was struggling with […] figuring out what to communicate to stakeholders and how to communicate it. (S7, I3)

Building upon acquired capabilities enables role confidence. To address outcome ambiguity, students drew on competencies developed throughout the course. Over weeks of engaging in strategy work, students had gained a much clearer understanding of what it means to be a strategist. For instance, they recognized that ambiguity is an inherent aspect of strategy and its communication. In preparing their final presentations, students began to use this ambiguity strategically:

> In the end it's also about a grade. And [the professor] is the one evaluating it. So it was nice to see, okay, he likes that idea. One of my groupmates even marked which [strategic] ideas he liked. And then we had a kind of selection criterion which probably also works similarly in real life when you are pitching to a manager or decision-maker who prefers one idea over another. (S9, I3)

Furthermore, many students emphasized how the course format pushed them to engage in tasks they initially felt uncomfortable with. Drawing on these experiences gave them a sense of confidence in their role as a strategist and, thus, their ability to deliver outcomes:

> Yes, I would say making decisions [was challenging], because I am not the most decisive person. And in this project, you really have to make decisions. […]. So, I definitely learned to trust more in what I do and to make decisions based on my own judgment. Especially toward the end, when it comes to deciding what to include in the final presentation on a certain topic and what to leave out. (S7, I3).

Security-focused peer support enables role confidence. Dealing with outcome ambiguity was not only an individual effort but also a collaborative one. However, such collaboration was often demanding in the intense time leading up to the presentation. Collaboration required work in managing the diverse needs of group members, yet was enabling a sense of security for the final challenges ahead.

> I had team members who were repeatedly messaging in the WhatsApp group every evening [in the week before the presentation] with a lot of panic, saying things like, 'Do you think we need this?' And I would think, 'Let's take a deep breath, calm down.' But then, of course, you engage with it, you respond to those three-minute voice messages in the evening to reassure them. (S2, I3).

Mutual support and collectively addressing remaining concerns allowed students to gain the confidence to stand behind their produced outcomes as strategists:

> Because you are in a group, you have your team members to rely on. You are not standing alone, and if five people say, 'Yes, this makes sense,' then you can trust that it does make sense. (S7, I3)

Aftermath: Students' key strategic learning outcomes

Being part of the strategy course was demanding for students, as they experienced a series of challenges while creating the required content and outcomes. Students were enthusiastic about their learning outcomes.

> I really think that in this course, with its format, I learnt much more compared to what is possible [to learn] in a normal lecture (S1, I4).

As students reflected on their experiences, two emerging strategic learning outcomes stood out (see Table 3 for additional evidence):

Critical strategic thinking. A key learning outcome of the course, from the students' perspective, was developing the ability to think critically about complex strategic problems by experimenting with different options and questioning their own assumptions ('Does it make sense? Is it really helpful?' S4, I4). For instance, S9 emphasized that they learned to create distance from their own viewpoint to see the bigger picture:

> [I learnt that] you sometimes have to try to step back and look at it as if from the outside, to see it as objectively as possible, […] am I currently doing everything possible, or am I just stuck in tunnel vision?

Resilience in ambiguity. Another fundamental learning outcome of the course was that students, at least in their own perception, developed the ability to deal with the ambiguity present in the strategy course. Students built resilience in managing uncertain situations, such as dealing with incomplete information about an uncertain future, and addressing ill-defined problems:

> I also found it exciting to experience dealing with this uncertainty […] that even if there is uncertainty at the beginning, nothing bad happens. In fact, something positive can come out of it if you just push through. You do not necessarily need to overthink and worry so much. Instead, you can trust the process, and things will work out. (S8, I4)

The role of ambiguity for role transitions in problem-based strategy education

Conceptual interpretation

Students encountered three subsequent types of ambiguity in the process of transitioning into a strategist role: entry ambiguity, content ambiguity and outcome ambiguity. Furthermore, we show responses to navigate these ambiguities and develop readiness, effectiveness and confidence for the strategist role. Figure 1 provides a process model that summarizes the types of ambigu-

ity, associated responses and role implications across three conceptual phases.

The first phase of our model shows that PBL in strategy settings may involve substantial 'entry ambiguity' that stems from two sources. First, it arises as students realize that they are responsible for their own progress throughout the course. Problem-based strategy education thus represents a significant shift for students used to passive roles in traditional teaching. Second, it is connected to the role-related ambiguity of strategy work as students are expected to enact a strategist role that comes without predefined scripts. While entry ambiguity evokes feelings of insecurity, it is not perceived negatively. On the contrary, entry ambiguity is accompanied by a sense of excitement and empowerment, as students anticipate the freedom implied by both the teaching format and the strategist role.

Entry ambiguity evokes two responses that enable students to achieve readiness for the role to play (continuous arrows in Phase I). Students draw upon capabilities developed outside the university to establish a sense of security for themselves. Furthermore, students seek reassurance from the mentor. Safety-focused mentor interventions, that is, subtle, consistent signals of accessibility and support, foster a climate of trust, which plays a crucial role in helping students feel ready to assume the new role (role readiness, dotted box in Phase I).

As students feel ready for the strategist role, they begin engaging with the content of the strategy course (dotted arrow between Phases I and II). This introduces the new challenge of 'content ambiguity'. It refers to students' insecurity about how to create strategy content, including challenges in identifying, analysing and interpreting strategic information. Content ambiguity thus corresponds closely to intrinsic ambiguity in strategic decision-making, where information is incomplete and outcomes uncertain. It is also connected to role-related ambiguity, as the elusive nature of strategy offers little guidance on what a strategist should do, inviting an overwhelming array of options.

Content ambiguity evokes interdependent responses, enabling students to accomplish 'role effectiveness'. One key response by students involved experimenting with established strategy tools which initially seemed unambiguous. Yet, these tools (e.g. PESTEL) proved in fact ambiguous, offering multiple ways to interpret and apply them. They are thus only a starting point for further activities. As another key response, students sought guidance from the lecturer and their peers to reflect on, validate and refine their strategic analyses. As shown in the model (see the circular loop in Phase II), these responses were not independent of each other but formed a cyclical process: experimenting with strategy tools triggered new ambiguity, which prompted renewed collaboration and mentor input, which in turn shaped further strategy tool use. Over time, this process enabled students to act effectively in the strategist role.

As students are able to effectively formulate strategy, their focus shifts towards the final outcome to be delivered (dotted arrow between Phases II and III). At this point, students encounter 'outcome ambiguity'. This ambiguity refers to the uncertainty students experience when crafting a compelling presentation for stakeholders. Even with defined content, ambiguity remains regarding how to structure it, what to prioritize and what will be considered convincing. Outcome ambiguity is connected to both intrinsic and role-related ambiguity: the open-ended nature of strategy reflects intrinsic ambiguity, while the ongoing elusiveness about what is expected from someone in the strategist role illustrates role-related ambiguity.

As shown in the model (see Phase III in Figure 1), two key responses enabled students to develop role confidence. First, they engaged in security-focused peer collaboration, relying on team members to validate and refine the final presentation. In contrast to earlier phases, they increasingly relied on each other rather than mentor input. Second, they began to draw upon the capabilities acquired in the process, such as recognizing that strategy is inherently ambiguous. This perspective helped them reframe their doubts and tolerate ambiguity more comfortably. Importantly, students not only responded to ambiguity in this phase, they began to use it strategically. They framed issues strategically, tailored arguments to stakeholder concerns and deliberately chose how to present unresolved aspects. Through this process, students felt confident in the strategist role by the end of the course.

Theoretical contributions

In recent years, business schools have increasingly embraced experiential approaches like PBL that are assumed to enhance learning outcomes compared to traditional methods (Anderson *et al.*, 2018, 2025; Mason *et al.*, 2024). At their core, experiential approaches engage students in real-world tasks as a means of professional learning (Dean, Wright and Forray, 2020). In the context of strategy, such engagement inevitably involves ambiguity (Abdallah and Langley, 2014; Plotnikova, Brielmaier and Friesl, 2025). However, we still know little about how students experience ambiguity and how it shapes their learning, raising important questions about how to best structure experiential strategy education (Bell *et al.*, 2018; Hallinger, 2021; Ungaretti *et al.*, 2015). Against this backdrop, we make two contributions to the strategy education literature.

First, our paper contributes to a deeper understanding of how learning unfolds in experiential strategy education by shifting attention to students' perspectives and learning experiences. While prior work empha-

sizes the pedagogical value of approaches like PBL in mirroring the complexity and ambiguity of strategy work (Dent and Fearon, 2025; Grant and Baden-Fuller, 2018; Mintzberg, 2004), it offers little insight into how students actually experience this ambiguity and what enables their learning within it. Building on the foundations of experiential learning as engagement with real-world complexity, we conceptualize learning in strategy education as a process in which students begin to inhabit the role of a strategist (Merton, 1957; Reinsch *et al.*, 2023). Prior research argues that this occurs as actors practically engage with the specific characteristics of the role (Bolander, Holmberg and Fellbom, 2019). In this respect, we show that role transitioning unfolds through students' engagement with a sequence of three distinct forms of ambiguity: entry, content and outcome ambiguity. Each type of ambiguity evokes different responses that gradually enable students to develop role readiness, effectiveness and confidence. These forms closely, but differently, resemble the role-related, intrinsic and strategic ambiguities of real-world strategy work (see Cappellaro, Compagni and Vaara, 2021; Whittington, 2019). Entry ambiguity arises as students leave their passive learner role (e.g. O'Flanagan and Jester, 2025) and face role–related ambiguity about how to enact the strategist role. Content ambiguity blends role–related and intrinsic ambiguity, as students grapple with which tools to use, what information to analyse and how to interpret results in the absence of clear templates (Plotnikova, Brielmaier and Friesl, 2025). We thus go beyond treating ambiguity as a monolithic construct (e.g. Bell *et al.*, 2018; Crosina *et al.*, 2024; Ungaretti *et al.*, 2015) by showing how students experience and progressively address and ultimately leverage different forms of ambiguity over time. In doing so, we demonstrate that experiential formats like PBL do more than simulate strategy practice and its complexities; they create a space in which students engage with the real-world ambiguities of strategy work and learn to inhabit a professional role identity through them.

Second, we contribute to strategy education by showing how ambiguity can be effectively leveraged as a pedagogical design choice and a powerful learning catalyst. Thereby, our study responds to calls for the effective design of problem-based strategy education (Hallinger, 2021; Ungaretti *et al.*, 2015). Previous research in strategy and management education has noted the limited attention given to ambiguity (Dent and Fearon, 2025; Grant and Baden-Fuller, 2018) even though, as Bell *et al.* (2018, p. 237) argue, a core aim of today's strategy education should be to 'develop students' abilities to deal with paradoxes and ambiguity'. We demonstrate that this goal can be achieved by confronting students deliberately with ambiguity during the learning process. Specifically, our findings suggest that exposure to and the successful navigation of ambiguity ultimately enables 'resilience in ambiguity' and 'critical strategic thinking'. However, developing these learning outcomes is not automatic; it requires specific enabling conditions. Our paper identifies two critical conditions that facilitate students' ability to critically reflect and develop resilience in ambiguity: Peer collaboration and mentor interventions. Mentor interventions play a particularly important role but must evolve over time, shifting from broad psychological support to targeted strategic guidance. Initially, safety-focused mentor interventions need to establish a climate of trust (Edmondson, 1999), helping students to begin engaging with strategy content despite the pervasive ambiguity in the learning environment. As students progress, contingency-based mentor interventions become essential, enabling students to narrow strategic options from a wide range of possibilities and providing input for further reflection. Peers also constitute a key resource in the learning process. Contingency-based peer collaborations enable collective reflection and sensemaking of the inherent ambiguity of strategy and its tools (e.g. Wright, Paroutis and Blettner, 2013). Later, as students focus on outcomes, peer collaboration shifts towards security-focused interactions, where peers validate strategic choices and thereby enhance confidence in the results produced. Thus, making ambiguity a productive part of strategy education requires not only its deliberate inclusion but also the creation of supportive and adapting conditions over time that enable students to work through the ambiguity experienced. While only rarely observed in our setting, the 'dark side' of PBL, such as group conflicts or exclusion, remains a potential risk (Ryberg, 2024) and represents an important avenue for future research in problem-based strategy education.

Limitations

Like any other study, ours is subject to limitations. Our findings are based on an in-depth, longitudinal study of 13 students across two iterations of a postgraduate strategy course. While this specific setting limits generalizability, it is well suited for developing theoretical insight into the unfolding nature of learning as role transitioning in experiential strategy education that remains underexplored (Ozcan, Han and Graebner, 2017). Moreover, our sample represents a subset (∼30%) of the cohorts and may reflect self-selection bias, as students opting into an elective strategy course might already be more open to ambiguity. To enhance the robustness of our findings, we provide extensive additional evidence (Tables 2 and 3) and conducted a focus group with three additional students who were not part of the interview sample. Their reflections on the course and our process model confirmed our findings (see Appendix A).

Conclusion

Our paper responds to enduring calls for more practice-centred strategy education (e.g. Greiner *et al.*, 2003; Jarzabkowski and Whittington, 2008; Mason *et al.*, 2024). While entrepreneurship education has long debated how to authentically incorporate ambiguity and real-world experiences into the curriculum (e.g. Neck and Greene, 2011; Neck, Greene and Brush, 2014), strategy education has been more reluctant to explore and adopt such approaches (Bell *et al.*, 2018; Grant and Baden-Fuller, 2018). Our paper illustrates that role transitioning and thus learning in problem-based strategy education is inseparably linked to the ambiguity inherent in strategy. We provide practical insights into the design of PBL in strategy education, particularly regarding the evolving role of lecturers in supporting students through ambiguity. Yet, PBL also has significant implications for lecturers. Traditional teaching places lecturers at the centre of learning, but PBL requires them to step back, relinquish control and embrace a facilitative role. This shift can create role-related ambiguity for lecturers themselves, particularly those accustomed to traditional teaching role identities. Future research should explore such identity-based role transition (Ashforth, 2001) and how lecturers can be prepared to adopt problem-based strategy education effectively.

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Appendix A: Focus group evidence for theoretical confirmation and robustness

Table A1. ***Focus group quotes validating the process model (see Figure 1).***

I would generally say that this definitely reflects my experience. (Focus Group Participant 1)
I agree as well and would go along with the feedback loop [Phase 2], […], I agree with the whole model, with the diagram that is currently being shown (Focus Group Participant 2)
Yes, I can only confirm that the [theoretical model] fits well [to my experience]. (Focus Group Participant 3)

Table A2. Additional evidence for second-order themes from focus group

Phase I		
Entry ambiguity	Building upon existing capabilities enables role readiness	Safety-focused mentor support enables role readiness
Yes, so I think, generally, it's actually good to be thrown into it like that, because that's more like how things can be in a real job later on, […]. But it was also a bit overwhelming at the beginning. I think for many people, I'm speaking a bit on behalf of my group, that there was quite a lot of information at the start, and you really had to read up on things. (Focus Group Participant 1)	One advantage was that we had the automotive industry, where everyone already has at least a bit of basic understanding. I think there are definitely much more difficult industries, but it was actually quite good that it was at least a very tangible industry [to start with]. (Focus Group Participant 1)	Yeah, I thought they [milestones, feedback meetings with the mentor and material provided] at least provided a guiding structure, I liked that. Otherwise, you would just start off without direction, and it feels easy to get lost in the details or go down a path that turns out to be pointless in the end. (Focus Group Participant 1)
So at the beginning, of course, we started off with a bit of uncertainty. […] Like, okay, we are doing things differently here [in the course], and that's naturally always accompanied by some uncertainty […]. (Focus Group Participant 2)	I like working with frameworks like that. They are just kind of part of business studies. Most of them, like Porter's Five Forces and so on, I already knew, and then you can also draw on prior knowledge and apply it again. (Focus Group Participant 2)	And the professor also said many times: don't worry, we will get there and I think when you really feel that it's not just being said, but it's actually true, that you're developing it [feeling of safety], then I can also feel a bit more secure […] That's why the uncertainty at the beginning that we were not knowing what to expect, did not really bother me, because I still felt relatively safe in the environment. (Focus Group Participant 2)
It felt like that [uncertainty], because there was nothing to hold on to, it was like: just start swimming now, and you are the one, go ahead. And you are in this pool thinking, 'Wait, who am I even [to do strategy]?' And first you have to figure out who you are. That's how it starts, and that's the uncertainty. Yes, it was definitely there. (Focus Group Participant 3)	Personally, I have a few years of professional experience [that helped me in the beginnung]. It started with a bachelor's degree that I completed alongside regular work. That program was focused on business administration. After that, I gained professional experience in project management related to transformation […]. That is why this topic, or module, was so exciting for me (Focus Group Participant 3)	That the professor said, 'Yes, we will do this, don't stress about it,' I was able to trust in that. This […] definitely helped me reduce the uncertainty I had when I first entered the room. (Focus Group Participant 3)

Table A2. (Continued)

Phase II		
Content ambiguity	Experimenting with established strategy tools enables role effectiveness.	Contingency-focused peer collaboration and mentor intervention enables role effectiveness
Especially in a [strategy] module like the one we had here [is uncertainty how to act], where things are not necessarily unclear, but there are multiple ways to solve the task and different possible solutions. (Focus Group Participant 2) Early there was the general question, that was already tricky for us "which market are you even focusing on?" We ended up choosing the European market, but we could have taken the U.S. market, which would have been a completely different starting point. […] There is no "wrong" you could [theoretically] do everything (Focus Group Participant 3)	I found that they [strategy tools] gave us a good direction [to start] […] but it is still the case that if ten people do a SWOT analysis, you'll probably get ten different results and maybe even more so with a scenario analysis, where you can go in completely different directions. So in that sense, yes, it's clear that there just is not one right solution. Things can go in a certain direction, but still, I definitely appreciated that they provided [strategy tools] a framework, which helped you know where to start. (Focus Group Participant 1) Well, I would definitely say strategy tools, those frameworks, exactly, they basically gave me a sense of security [what to do as a strategist in the course]. (Focus Group Participant 2)	Being in a group definitely reduces a lot of the uncertainty for me […]. And when you present an idea [of the many theoretically] possible and everyone in your group says, 'Yeah, I agree,' or maybe adds a small change, that really takes away a lot of the uncertainty for me, just being able to check in with fellow students. (Focus Group Participant 2) I would even say that one thing leads to the other [peer collaboration and mentor feedback] because when you solve a problem, new questions come up, like: does this still work for you? Because you've now come up with something, and then you want feedback to see if it's going in the right direction. And then you get feedback, continue working, and dive deeper into it. That's what we did, first within our group, and then after that, there were the feedback sessions. […] And so it all went hand in hand, and eventually we reached the point where we had what we were aiming for (Focus Group Participant 3).
Phase III		
Outcome ambiguity	Building upon acquired capabilities enables role confidence	Security-focused peer support enables role confidence.
So there were repeated discussions about the results [for the final presentation] or whether we might not want to go in a different direction (Focus Group Participant 1) Yes, the uncertainty was there; it was noticeable for all of us in the group [before the presentation] (Focus Group Participant 3)	That's part of it [to use ambiguity strategically]! You don't have to talk negatively about yourself, when you are presenting a new strategy […] it's not a bad thing to leave out negative aspects (Focus Group Participant 1) It's really like, you develop it, and I could feel more confident as I know that there is not this […] a single correct solution […] developing a strategy [for the presentation] […] that is [simply] not something where there is a predefined solution or where you can say one is right and the other is wrong (Focus Group Participant 2)	The discussions within the group, or the fact that we, as a group, agreed and said, "This is now our strategy [for the presentation]" that definitely gave me a sense of security. (Focus Group Participant 2) It was like that [as shown for phase 3 in the model]. For us in the group […] [the mutual support] gave us the necessary confidence to argue it that way [in the presentation], which we did! (Focus Group Participant 3)

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