

Shared Mental Models as the Framework for Team Role Development: A Grounded Model of Dynamics in Student New Venture Teams

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Abstract

This study delves into the intricate relationship between student team roles, dynamics, and performance in the context of entrepreneurship education. New venture teams are a central element in entrepreneurial education, and understanding the interplay between team roles and dynamics is critical. Conducted at the University of Bremen, Germany, this multiple case study addresses two primary questions: (1) How do student team roles develop during new venture courses, and how do they impact team dynamics? (2) What influence do dynamic transitions in role assumptions exert on the outcomes of student teams in new venture courses? The insights gained from multiple cases of student new venture teams are synthesized into a dynamic, grounded model, visually representing the interplay between team role construction, dynamics, and performance. This study contributes empirical insights into the nuanced development of team roles in entrepreneurship education, offering a deeper understanding of their influence on team dynamics and overall performance.

Keywords: *Entrepreneurship Education, Shared Mental Models, Roles, Student Entrepreneurship, Team Formation*

1 Introduction

Entrepreneurship education is a global phenomenon that contributes to economic growth and value creation by facilitating prospective students to create new ventures by preparing them with essential skills and knowledge (Kaufmann, 2009; Hytti et al., 2010). As new venture teams founded the majority of startups, they have become increasingly popular in entrepreneurship education. Teams in entrepreneurship education are used to simulate entrepreneurial practice and enable a profound experience of what being part of a founding team might feel like (Giacomin et al., 2016; Gibb, 2011). This shows the importance of a well-functioning collaboration between students in new venture courses to nurture the entrepreneurial interest of students. The way how teamwork takes place is crucial for thriving student collaboration, learning, and skill development (Warhuus et al., 2021; Forehand et al., 2016). Research has also shown that the success and direction of new ventures is determined by the way in which entrepreneurial team members cooperate (Agarwal et al., 2016; Chowdhury & Endres, 2005; Dufays & Huybrechts, 2016; Thiess et al., 2016). So far, the literature mainly discusses influential factors on team performance, which may be team development (Peralta et al., 2018; Bonebright,

2010; Miller, 2003) or team roles or certain role behavior (Chen & Agrawal, 2018; Forehand et al., 2016; Driskell et al., 2017). However, these factors have been identified separately from each other. As roles and development are both based upon behavior, researchers loosely identified a relation between these concepts, but the underlying antecedents and mechanisms of how they influence each other in their development and evolution remain unclear (Davies, 2009; Forehand et al., 2016; Hall & Buzwell, 2012).

We take this as an opportunity to saturate the demand for more empirical work and to better understand the dynamics in entrepreneurship student team behavior (Chen & Agrawal, 2018). Therefore, this research aims to understand the development of student team dynamics through team role evolution and how both enable team functioning and influence team performance. Additionally, we want to identify and explain mechanics that lead to the development and maturation of team roles as we propose an interdependent relation between role- and team dynamics development. To fulfill these aims and gain deeper, more holistic insights into the functioning of student new venture teams, we developed the following research questions:

- How are student team roles developed during new venture courses, and how do they influence

team dynamics?

- How do dynamic transitions of role assumptions influence the new venture course outcome of student teams?

To give an answer to these research questions, this study rests upon a multiple case study analysis based on a student entrepreneurship course at the University of Bremen in Germany. The data was collected through semi-structured interviews with an intensive interviewing style and theoretical sampling method with student course participants. The findings gathered in this study were evaluated through the theory of shared mental models (SMMs), which enabled us to formulate the mechanics of role development and draw a connection to team dynamics and performance. They were then assembled in a dynamic, grounded model that provides a visualization of the interplay of team role construction, team dynamics, and the effect on team performance.

2 Conceptual Backgrounds

2.1 Entrepreneurship Education

Entrepreneurship education (EE) research comprises many issues regarding what to teach, who to teach, and how to teach it (Turner & Gianiodis, 2018). So far, a universally applicable definition of EE is missing in academic literature. However, there is a shared basic understanding that EE is about encouraging skill- and knowledge development to promote enterprising behavior and stimulate new venture creation (Freiling & Harima, 2019b; Freiling & Harima, 2019c; Maritz & Brown, 2013; Henry & Lewis, 2018).

The foundation for most EE-research is a framework developed by Jamieson (1984) which differentiates three categories of entrepreneurship education: training/teaching (1) about, (2) for, and (3) in an enterprise. Depending on the category, the specific content, the aim of teaching, and the target-audience vary. One example is that when teaching enterprise and entrepreneurship, the aim is to prepare future entrepreneurs for founding new ventures and self-employment. In this category, specific contents would be the identification and exploitation of business opportunities as well as general knowledge on how to set up a business (Freiling & Harima, 2019d). Building upon this

framework, scholars have debated over different outcomes of EE (Pit-taway & Cope, 2007; Matlay, 2008), the course- and audience-specific objectives (Heinonen & Poikkijoki, 2006; Boocock & Warren, 2009), and many other sub-fields within pedagogy, course design and target audience (Mwasalwiba, 2010). However, more current research criticizes the range of various contexts and the lack of generalizability of these previous studies (Thomassen et al., 2020; Henry & Lewis, 2018). In their context-based framework, Thomassen et al. (2020) highlight context as an important theme in EE research as it determines the influence of EE on the student's attitude towards entrepreneurship, entrepreneurial learning, -action, -intent, and -motivation. Based on an extensive literature analysis, they specified three contextual levels – macro, meso, and micro-level – to cluster similar contextual elements such as temporal, spatial, and sociological aspects. Whereas the macro-level is defined as the geographic setting and the meso-level contains elements regarding regional and institutional effects, the micro-level focuses on individual actors and interactions, meaning pedagogy and didactics, students, educators, content, and networks. Context elements interact and impact each other, implying a dynamic connection between elements like social networks, student's learning behavior, motivation, individual competences, and educator's knowledge and skills. This interplay influences the degree of EE's impact on students. Additionally, the interplay and interdependency of context elements suggest a dynamic nature of EE on the micro-level, therefore setting the foundation for our research on student team dynamics and roles.

2.2 Student New Venture Teams

Within the research field of entrepreneurship education, scholars have recently shown a growing interest in examining entrepreneurial student teams since they are used as a learning method in experiential-based entrepreneurship courses. (Chen & Agrawal, 2018; Neumeyer & Santos, 2020). Due to the novelty of the topic of student new venture teams, a consistent definition is still missing. In general, they aim to simulate the entrepreneurial experience of founding a new venture and teach students entrepreneurial skills and behavior. Thus, they imitate actual new venture teams (Giacomin et al., 2016; Harima, Gießemann, Götsch & Schlichting, 2021).

Research on student new venture teams or student teams in EE is scarce, and very little is known about them. Scholars researching in that specific field frequently use well-advanced research on pedagogics and teams and apply existing concepts to entrepreneurship- and student teams. For example, Warhuus et al. (2021) examined the influence of the team formation mode on subsequent teamwork in an entrepreneurship course. They identified that randomly assigned teams struggle more in a new venture founding course than self-assigned teams as they focus less on the team's well-being, resulting in project success being the only measure of well-being. This imbalance causes restricted team reflexivity and, therefore, less effectiveness. Neumeyer & Santos (2020) also focused on team formation in EE but were concerned with the impact of gender composition. They found that teams composed of more women than men performed and communicated better than teams composed of men or fewer women than men. Another study dealing with student new venture teams analyzed team behavior and leadership during the team development stages that were established by Tuckman & Jensen in 1977. Their results suggest that a leader within an entrepreneurial student team positively impacts team cohesion, leading to knowledge sharing and a better-perceived team performance (Chen & Agrawal, 2018).

Within the literature on teams – in an organizational as well as educational context – there is an ongoing debate on the influencing factors of team performance (Harms, 2015). Scholars have linked (entrepreneurial) team performance to many concepts, such as team composition (Neumeyer & Santos, 2020; Karlsson & Nowell, 2020), team roles (Driskell et al., 2017; Thirasak, 2020; Harima, Krocak, & Repnik, 2021), team development (Peralta et al., 2018; Kuipers & Stoker, 2009; Tuckman & Jensen, 1977). So far, these influencing factors have only been examined statically and separately as team development theories neglect interpersonal relations and how team roles develop (Peralta et al., 2018). Some research, however, suggests an interdependency between team development and team roles. In their study, in which they developed a reliable measurement of team development, Peralta et al. (2018) concluded that considering a team's developmental stages is not enough to fully

understand team performance as interpersonal dimensions need to be considered. Additionally, established definitions describe team roles as “patterns of behavior” (Driskell et al., 2017, p. 486) and team development as “the overall set of group processes reflecting a team's actions and behavior” (Kuipers & Stoker, 2009, p. 408). This implies that team roles as behavioral patterns are part of the processes that make up team development. This is consistent with observations of several educational researchers who studied behavioral role phenomena like free-riding and identified an impact on team development and performance (Davies, 2009; Forehand et al., 2016; Hall & Buzwell, 2012).

The study by Chen & Agrawal (2018) on team behavior and leadership during the team development stages and their influence on team performance is precious to this discussion because its findings show a connection between a team role (leadership), team behavior, and team performance. Our study builds upon their research and contributes to the discussion on team performance by theorizing the emergence and development of team roles in an interdependent process with team development and how this dynamic process influences team performance. As we treat team roles, behaviors, and development as the dynamic entities they are (Peralta et al., 2018), We also enhance the outdated static models by developing a unique, grounded model of the interplay and development of roles and their influence on team development and performance. The definition of team performance, however, varies heavily depending on the underlying context of a study (Chen & Agrawal, 2018). Whereas some studies measure the quality of outcome (Knipfer et al., 2018), others focus on the perceived performance of team members (Chen & Agrawal, 2018). A study conducted by Harms (2015) examined team learning within a bachelor entrepreneurship course. He measured team performances based on the teacher's assessment. It consisted of five team deliverables for the teacher to reflect on the team's project process. As our case studies took place in a similar course and grading setting, we adapted this understanding of team performance.

2.3 Shared Mental Models

The concept of shared mental models was initially introduced by Cannon-Bowers et al. (1993) to

understand implicit team coordination and explain differing team performances. SMMs are defined as the “team members’ shared, organized understanding and mental representation of knowledge about key elements of the team’s relevant environment” (Mohammed et al., 2010, p. 879). These fundamental elements can refer to the team members’ relations, characteristics, and working mechanisms as well as task goals, procedures, and performance expectations (Uitdewilligen et al., 2021; Xiang et al., 2016; Cannon-Bowers et al., 1993). Having a shared understanding of these key elements enables the team members to anticipate and predict the behaviors, needs, and actions of one another. Based on that knowledge, they can adapt their own actions and behaviors to these tasks and team demands (Mohammed et al., 2010; Uitdewilligen et al., 2018). Oversimplified, one can say that having shared mental models means that the team members are “on the same page.”

As the construct of SMMs was initially developed to explain differences in team performances, an extant body of literature regarding the effects of SMMs evolved over the past 20-25 years. In general, the results of many studies suggest that SMMs positively influence team performance (Mathieu et al., 2000; Xiang et al., 2016; Jo, 2012; Xiang et al., 2013), which led to an overall academic agreement concerning this relationship. Additionally, researchers found that this relationship is mediated by team interaction processes such as coordination, cooperation, collaboration, and communication as they reduce the amount of conflict and misunderstandings and decrease uncertainty within a team (Uitdewilligen et al., 2021; van Rensburg et al., 2022, Mathieu et al., 2000; Zhou & Wang, 2010). This mediating effect means that team members interact better and more effectively with each other if they have SMMs, which results in increased team performance. More current studies go into detail on either the effects of SMMs or SMMs in general. For example, Uitdewilligen and colleagues (2021) argue that the more complex a team’s SMM is, the richer the team’s knowledge is. These teams tend to perform better as dynamic environments require the ability to process lots of information quickly and adapt accordingly. On the other side, Santos and colleagues (2015b) examined the influence of SMMs on creativity. Creativity is also essential in modern work settings, as teams and organizations

have to be innovative to keep up with quickly changing markets and demands. The researchers tested the relationship by collecting data from over 150 teams in a management simulation and found that SMMs influence creativity by reducing team conflict. As teams with strong SMMs would engage less in conflict and have similar working mechanisms, creativity among the team members is fostered.

All these studies have in common that SMMs are used to explain behaviors that lead to better team processes or performance. They argue that the development of SMMs within a team changes the team members’ behavior as they adapt to the team and the task situation. This adaptation leads to what is conceptualized as team processes: Teams with SMM – adapted behaviors – coordinate, cooperate, and communicate better and, therefore, show higher levels of team performance. On an individual level, mental models are furthermore defined as the foundation for all a person’s behavioral mechanisms. Altogether, it can be concluded that there is a connection between SMMs and behavior as mental models – shared or not – shape an individual’s behavior. This relation is why SMMs are a suitable construct for our research. We propose an interplay of SMMs, roles, and team development because team roles are defined as behavioral patterns, and according to SMM literature, changing mental models result in changing behaviors. Moreover, the concept of SMMs connects internal team processes that can be linked to team development with team performance, thus clipping together almost all the relevant concepts for our model.

What is missing in current SMM literature, however, is research on the developmental processes of SMMs within a team (Mohammed et al., 2010). We know that SMMs develop through a team’s progress and are constantly refined (Uitdewilligen et al., 2018). Moreover, Van den Bossch et al. (2010) tried to capture the process by conceptualizing the development of SMM as a dynamic process of the continuous co-construction of meaning within a team where understandings, perspectives, and opinions (individual mental models) are common and constantly constructed, denied, and re-constructed until the team reaches a similar construction of meaning (mental model). These construction processes happen mostly unconsciously and sometimes even implicitly. The

co-construction process can be considered the more complex and complicated variant of adapting to the team and task demands. Apart from that, we know very little about the emergence and evolution of SMMs, as researchers seem to have neglected this topic. Therefore, a deductive approach for our research was out of the question.

3 Methodology

3.1 Research Design

Our setting is a university entrepreneurship education course at the University of Bremen in which students form student new venture teams to simulate founding a startup company. This course is available to the students who chose entrepreneurship as one of the two essential focuses of the business economics master's degree and as one of six mandatory elective modules. As the study unfolds, it is important to note that the three researchers of this paper also participated in this course. This leaves them with unique knowledge about the course and plays an integral role in our research design and how data was selected in the process.

The research design follows the methodology of Gioia et al. (2012), which is a "systematic inductive approach to concept development" (p.16) of grounded theory and thus enables high-quality qualitative research. During this methodology, we construct a data structure based on semi-structured interviews to identify patterns systematically. The analysis process of multiple-level categories is visualized and aims to capture theoretical insights of the researched phenomenon from a meta-perspective. The Gioia methodology aims to create a dynamic inductive model grounded in data that shows dynamic relationships between concepts and how data relates to theory. Thus, the inductive approach is completed, and a newly generated grounded theory is resulting. As teamwork is mandatory for the course, we applied the Gioia methodology to a multiple-case study approach in which we researched three participating teams. While the literature has difficulties in describing what a case study is (Søilen & Huber, 2006), a possible definition might be "an intensive study about a person, a group of people or a unit, which is aimed to generalize over several units" (Gustaffson, 2017, p.2). The inaugurated benefits of a multiple case study are the ability to compare differences and similarities of the researched cases

(Baxter & Jack, 2008; Stake, 1995) and analyze gathered data within the observed scenarios or across scenarios (Yin, 2003). We used this method to compare the differences and similarities between the three teams we picked through theoretical sampling and analyze their course progress.

3.2 Data Selection and Collection

The research design influenced our data selection, a multiple case study based on the course. We selected potential interviewees for our interview guide utilizing the method of theoretical sampling by purposely selecting cases that we regarded as typical or extreme for maximal variation and to develop our emerging theory. Furthermore, we aimed for cases in which our research subject was observable at various levels and was easily accessible. This selection was enabled by the fact that they were former course participants. Also, we decided to include experts (e.g., course educators) to validate the gathered student data externally. The educators in this course also conducted mandatory team coaching, which enabled deep insights into team dynamics and allowed us to observe behavior we could not identify. Therefore, our data selection requirements were: Being a participant of the course in the winter semester 2021/22, as they had first-hand experience with the subject or being an educator of the course. We also selected at least two participants from each student team to observe differing perspectives within the team. We included outliers in team performance regarding specific team roles (e.g., free-riders, leaders, etc.) and observed team dynamics (e.g., conflicts, pivots, etc.).

To collect our selected data, we turned to semi-structured interviews for our study. This type of interview contains a list of questions that can be asked in a flexible order, and its wording can be changed to be contextually appropriate to reflect the perspective of the experienced phenomenon by the interviewees. We utilized an intensive interviewing style, guiding the participants gently through the interview by relying on a one-sided conversation to fully understand the participant's perspectives on the research topic. This allowed us to gain detailed insights on first-hand experiences and follow-up on unanticipated areas of inquiry, implicit views, and accounts of action. These experiences were later combined with our own experiences and data. To gain external validation,

we conducted six student interviews (two from each team) and one expert interview (course educator).

3.3 Data Analysis

The initial codes from MAXQDA were extracted to MS Excel, where we reduced them into more compact categories. These categories adhered to the informant's terms and experiences of the researched phenomenon. Recoding the initial codes into informant-centric first-order categories helped reduce the sheer number of categories during the initial data analysis. Continuing with the coding procedure, we used an approach similar to the axial coding method used by Strauss & Corbin (1998). We sought similarities and differences among the first-order categories to cluster them into themes using the digital whiteboard platform MIRO for descriptive mind mapping. By progressing into this stage of code analysis, we enter a purely theoretical realm as we look at emerging themes in our data, suggesting possible concepts, tentative relationships, and explanations regarding the phenomenon. Therefore, we conducted a literature review to match the emerging categories from our data analysis with the theories and concepts we found within the literature, making it an abductive process. This approach reduces the number of available categories and abstracts the initial codes into theory-centric second-order themes. During this stage, a total of 8 second-order themes were identified. Overall, the data analysis, especially the organization of data from 1st to 2nd order categories, is the step that gives the research more structure and more qualitative rigor (Gioia et al., 2012).

After achieving theoretical saturation by gathering a workable set of themes and concepts, we reached the final stage of our data analysis. We aggregated our second-order themes into overarching theoretical dimensions of a higher ontological level using the second-order themes as sub-categories by using MIRO once again to gain a better overview of our data structure. During this process, we changed the theoretical lens derived from our literature research three times as we discussed how these dimensions answered our research questions. We concluded by using the theoretical lens of SMM and identified a total of four overarching theoretical themes.

4 Findings

4.1 Case Description

The course can be chosen as a compulsory module focusing on start-up management or as an elective module at the University of Bremen. In this course, students have to independently form and register among themselves in five to six teams based on a profile of inhibited hard skills, soft skills, and possible ideas (Freiling & Harima, 2019a). During the course, students have lectures and workshops where they are taught the design thinking method to apply to their projects. Additionally, this process is complemented by individual team coaching sessions. All teams go through four bi-weekly sprints, which have to be presented to the course at the end of the sprint. Here, the team's progress is documented, and feedback is obtained from other teams and educators. The sprints aim to go through the respective stages of the design thinking process and derive a market niche based on an iterative approach of identifying a particular pain to people. The module is concluded by a final pitch, which is held in front of the chair, the course participants, and other external interested parties. The sprints and the final pitch count as exams. The course aims to create a startup by developing a business idea based on the design thinking method. Course participants learn how to derive a gain through an existing pain from everyday life. Also, start-up skills (organization, opportunity recognition, idea development, presentation skills, teamwork, adaptation to circumstances, etc.) are to be built up, and students are to be prepared for possible start-up situations. Developing a business plan is irrelevant here as it could hinder creativity. As explained in the methodology, we were also course participants and, therefore, had a unique perspective and insight on the participating teams. The researched teams were handpicked based on theoretical sampling as they showed exciting observations, which will be explained further in this section.

The first team we included in this study is our own course team, which consists of six students, where four are male and two are of female gender. The team stands out as the previous leading role was split into two leading roles as the course progressed, which was not observed in any other team. Also, a free rider was not only identified by the team but also by the educator. The idea process was unclear, as each member had an individual idea

they wanted to contribute. The development of the idea took place over a more extended period and led to the fact that some team members could not originally identify with it. The team was particularly limited by the lack of hard skills and, therefore, had to settle for a limited selection. The split leading role allocation and the existence of a free rider gives reason to look deeper into how this role allocation may have impacted the course progression and the overall team's well-being and performance.

The second team we included in this study consists of six students, five male and one female. The team was suitable for investigation because it had a clear-cut leader with high levels of ambition and responsibility for the team. Still, the team contradictorily contained two free riders. During the course, this student team was considered one of the best. The team's idea development process was fairly linear, as two members wanted to address a topic from their previous sports economics major. In addition, other ideas were discarded because, similar to other teams, they could not be implemented by the team due to a lack of hard skills. The contradictory nature of the role allocation led us to study this team as we hope for interesting team dynamics and differing perceptions between the leading and free-riding roles.

The third team consists of five students, three male and two female. The team was suitable for study because they had a leadership change and were the only team to perform a pivot during the course (complete change of direction in the project). The team's idea development process is described as quick and effective. As the course progressed and feedback was received within the coaching sessions and sprints, more problems with the idea crystallized. This ultimately led to the team performing a 180-degree turnaround with their idea. The change of leadership and the conducted pivot could provide us with great insights into how these processes were handled within the team and altered or enhanced the team development and team performance.

4.2 Data Structure

In the following, the findings organized within the data structure will be present-ed by describing the categories that were identified during the interpretation of the empirical data. All informants

made subjective experiences that were to a certain degree, comparable to each other, whereas the overall team collaboration differed from team to team. This was especially the case when it came to open communication about roles an individual fulfilled in a team. Our findings are ar-ranged in four sections, organized around the core elements of our emerging framework. From a broader perspective, it shows the construction and development of team roles within the student new venture teams during the semester. Data Structure can be found in Figures 1 and 2.

4.2.1 Emergence of Initial Team Responsibility

The aggregated dimension emergence of initial team responsibility resulted from statements of informants about their own motivation to participate in the course and observations of other team members' behavior and attitudes. We identified two types of classifications of the main reason why a student chose to participate in the new venture course. The first classification includes students motivated to participate, originating from a practical-professional interest in project management, founding, and problem-solving. These students often had a personal interest in venture funding and were seeking practical experience in a safe environment. Another facet of the first classification is a course motivation related to the academic-theoretical interest in entrepreneurship and startups. Often based on prior experience in entrepreneurship education, for example, in a bachelor program.

"I had, and I still have, my own interests as well. I don't know, but I am someone who couldn't work for someone else my whole life. I don't know. And also back in EM1, I told my team [...], if we had a great idea now, why shouldn't we implement it later?"
[I05-C5]

These two characteristics were applied to the second-order code intrinsic motivation for initial course participation. The attitude of these students

towards the course can be rated as an individualistic approach to venture founding with a motivation that was not dependent on others participating in the course.

"And there, I threw parties in clubs with a buddy and earned relatively good money. It

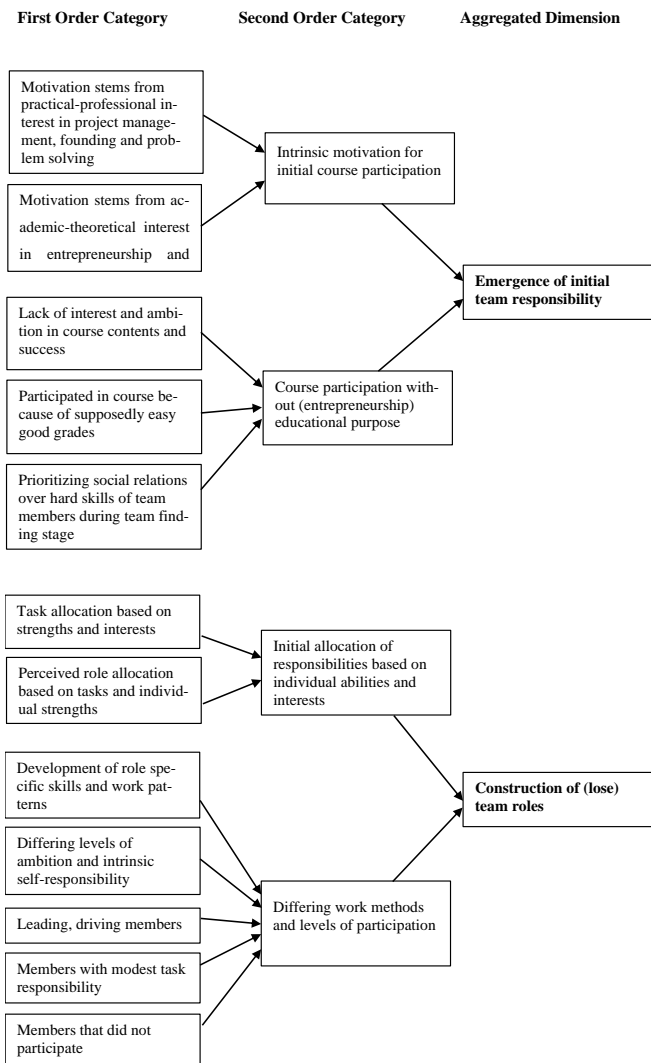


Figure 1: Data Structure (1/2)

kind of awakened this entrepreneurial spirit in me because I thought, okay, I want to experience more in that direction; I want to learn more about it." [I06-C2]

The second classification of course participants refers to students who chose the new venture course almost apart from the educational content. Some informants described a lack of interest and ambition in course contents and success when discussing some of their team members' work ethic. The priorities differed among individual team members, which became strongly visible regarding the time invested in the project and its tasks.

"And in the end, it was actually just negative because I was simply annoyed, having so much to do with all the tasks that other people hadn't done." [I03-C57]

Another indicator of differing priorities is the absence of intentions to find a new venture after the course. Often, the better chance of getting good

grades than in other classes was the driving factor. This addresses students focusing on their overall grade instead of the subject itself. The last aspect in this matter describes the behavior of prioritizing social relations over the hard skills of team members during the finding stage. This was especially the case when teams (partially) existed before or when students looked out for their friends regarding course selection.

"So, at the very beginning, I didn't really intend to choose the focus on Entrepreneurship Management because, before that, I hadn't had any experience or interaction with the entrepreneurship field, and I never really had any plans to start something myself." [I02-C1]

"And then I thought, 'Well, this is a good opportunity to join these groups in the modules with people I've already gotten to know a bit. So, I don't have to find completely new people in another module and have no idea what it's like to work with them or if we get along.'" [I02-C4]

We concluded these first-order categories to the second-order course participation without (entrepreneurship) educational purpose, which can be seen as the counterpart to the other second-order category underlying this dimension.

These two classifications depicted in the second-order categories implicate a different approach to entrepreneurial action with the project team. We see students with varying backgrounds in terms of course selection working in a team, which is a common thing, but at this point, we also suppose a different feeling of initial responsibility for the new venture project and, in the next step, the degree of initial team responsibility. This means we observe a correlation between the motivation to participate in the course and the initiated feeling of responsibility for the project team. This concludes the first aggregated dimension of the data structure emergence of initial team responsibility.

4.2.2 Construction of (Lose) Team Roles

The initial allocation of tasks within the teams was mainly determined by identifying team members' strengths and their choice to take over certain tasks to assure the best possible completion. For example, in the case of a team member with a lot

of experience in creating appealing presentation slides, it would not be efficient to let anybody else work on that. One informant even stated that team members with certain skills are mandatory for successful cooperation.

"But for some, I believe it's just not the case that they see themselves in a specific role from the beginning or have a bit of knowledge, so they can say, 'I'm good at this, and I would go through with it and do it for this module.'" [I01-C89]

The initial task allocation process of the teams is summed up as task allocation based on strengths and interests. This procedure is strongly related to the perceived role allocation, as shown in the following. One way of role allocation was described as team roles being received based on personal interest, which implies a more proactive behavior of students.

"I was overall satisfied with the role, and I sort of chose the role myself because I didn't necessarily want to delegate design and such. So, I voluntarily took that on, I would say." [I02-C55]

The other way roles were allocated was described as a somewhat unconscious procedure regarding task distribution. Informants delineated it as role allocation over time, strongly dependent on arising tasks. These two types of role allocations form the first-order code perceived role allocation based on tasks and individual strengths. All in all, we see a strong connection between the tasks initially undertaken and the feeling of responsibility toward the overall project. We conclude this in the second order category, the initial allocation of responsibilities based on individual abilities and interests.

An essential factor in the construction of team roles is how individuals encounter the team project on a personal level, which addresses statements by the informants regarding the work ethic and attitude of themselves or their teammates. First, a topic often mentioned concerns the differing levels of ambition and intrinsic self-responsibility. Informants described different levels or lack of work quality as a source of frustration; this could be based on the mentioned unclear individual course objectives and work ethics. The interviews point out three types of fellow students: leading and

driving members, members with modest task responsibility, and members who did not participate, which was the worst-case scenario for the remaining team members.

"Yeah. So, these were people for whom you couldn't assign a task, or who didn't see themselves in that role either." [I03-C52]

Students also developed role-specific skills during the semester, especially when the role fulfilment depended on the situation. For example, there was no initial desire to lead the team, and the required skills had to develop over time. That is summed up in the first-order category development of role-specific skills and work patterns. Previous remarks are composed by the second order category differing work methods and levels of participation. Combined with individual abilities and interests leading to the initial allocation of responsibilities, we conclude the aggregated dimension of construction of (lose) team roles. Based on our informants' statements, we assume that the role construction process within student new venture teams is based on responsibility allocation, level of participation, and working methods.

4.2.3 Solidification of Perceived Team Roles

As the time of collaboration extended, the teams developed a specific workflow to function successfully and fulfill the expectations of the course. Students became more familiar with their colleagues and individual roles, most important in leading the team. The project management role, often taken voluntarily, grew into a responsibility for numerous tasks and a perceived project responsibility. Tasks of leading members involved design, communication, and project management, as one informant explained. The awareness of this team role and the perceived acceptance by the team enabled an improved collaboration process regarding task distribution and motivation. Still, in some teams, the perceived unilateral assumption of responsibility led to negative emotions and frustration.

"I postponed many things from my free time for university appointments and then felt it was very unjustified that she prioritized her free time, and I consistently put my free time behind for university." [I04-C72]

Other vital roles that emerged next to the team lead

were members that focused on research and development of the product or the mediator role as an essential part of teamwork in terms of conflict prevention, as one informant said. All in all, we

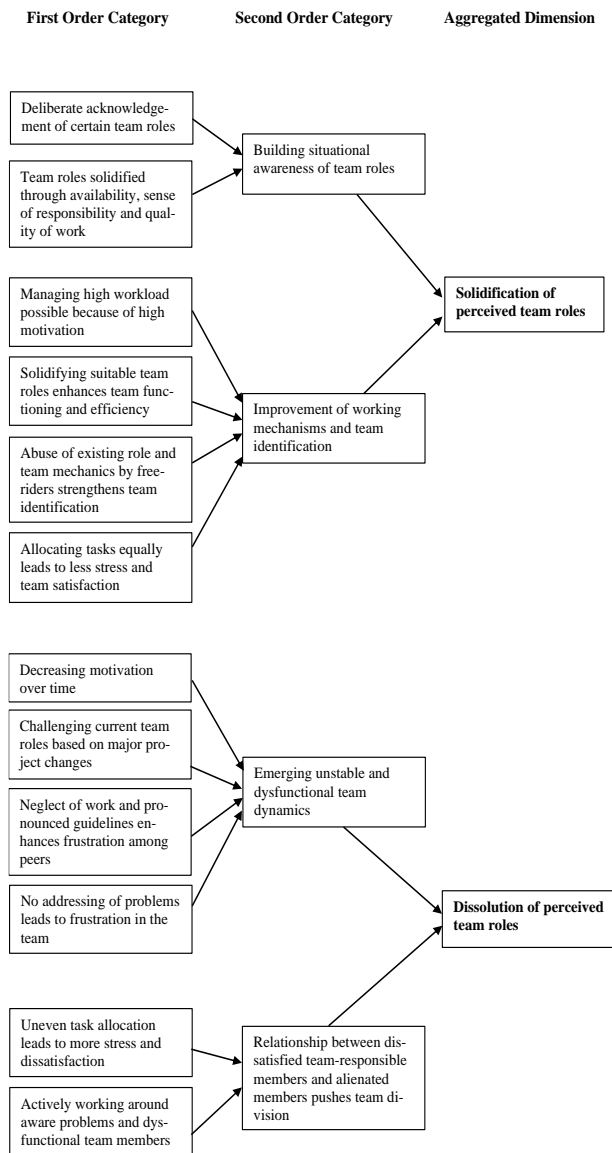


Figure 1: Data Structure (2/2)

observed a deliberate acknowledgment of specific team roles.

On the one hand, informants reported from students that stood out regarding a certain responsibility for the project's success, but what also came up was the opposite type of team member, particularly in the sense of availability to diminish workload for the rest of the team. Often mentioned were students who were motivated regarding the project's success but lazy regarding task fulfillment. This was particularly apparent in finishing tasks always on the last call and a distinct reliance on the functioning of others. Team members who tended to act like free riders released a lot of conflict

potential. High unreliability often leads to more stress and less motivation for the remaining team members. Their behavior influenced the team negatively. At later stages, it was more expensive to integrate them than to just take care of the work on your own, as an informant reported.

"I somehow felt with the other two people that you couldn't really talk about the whole topic anymore because they just had no idea where we were at. So, if I give them tasks that are somewhat larger than 'Create a team slide,' I end up with more work. [...] In other words, explaining to them what they should do becomes more work than if I just do it myself." [I03-C57]

Concluding the last abstract, we detect that team roles solidified through availability, sense of responsibility, and quality of work. From this point, the teams knew in what direction the dynamics of the team might develop and had a feeling of how characters in the team might influence the collaboration. We outline this in the second-order category, building situational awareness of team roles.

The other second-order category in this dimension is improved working mechanisms and team identification. With this category, we classified the enhanced collaboration resulting from more familiarity among team members. One informant, for instance, stressed that developed roles and positions lead to better coordination and orientation within the team. Another told us that allocated roles enhanced the team's efficiency and functioning and that working around a non-participating member brought the rest of the team closer together. We conclude these insights as solidifying suitable team roles enhances team functioning and efficiency.

"And I think that, after that initial crisis or the formation of positions, we all actually got into a pretty good working mode together. And then, we pulled together quite well." [I04-C61]

A topic that was mentioned many times was how to deal with stress. Informants expressed that during phases of higher strain, the team's success factor was a shared high motivation, which is taken up in managing a high workload possible because of high motivation. Another aspect was a clear project orientation for stress relief or establishing a good

workflow with shared responsibilities to avoid an unfair workload distribution. One team stood out by developing a co-leading role, where two students supported each other with shared overall project responsibilities.

"Maybe I've also learned more over time that you can just do it as a pair, that you can trust each other. [...] Yeah, I don't need to stress myself out because I know it works really well in the co-lead role." [I04-C123]

All teams had to cope with, especially students who took over responsibilities from the beginning of the project, the attitude of "taking everything for granted" by some team members. That means that voluntarily taking task responsibility at the beginning of the collaboration was often impossible to transfer to other team members at later stages, as one affected informant said.

"And yeah, it wasn't even up for debate whether someone else would support me or not. The others just assumed from the beginning that I would take over again." [I02-C56]

At the same time, it was observable that teams that experienced team members pulling themselves entirely out of responsibilities were brought even closer together. We conclude these aspects in abuse of existing roles and team mechanics by free riders strengthen team identification. The upcoming awareness of others and their own behavior, in combination with successfully implemented working mechanisms, clarified the understanding of what kind of collaboration patterns were necessary to succeed in the course. We subsume this in the third aggregated dimension, the solidification of perceived team roles.

4.2.4 Dissolution of Perceived Team Roles

The following abstract regarding the fourth aggregated dimension is based upon statements addressing difficulties and other developments within the teams that brought problems in the collaboration. Furthermore, it needs to be mentioned that roles were also dissolved in some cases when a team member started to work in a different position to support the project since a former role was not required anymore. A big subject was the decreasing motivation over time. In the beginning, the team motivation was high but

decreased over time since some team members lowered their efforts at some point during the semester, as informants reported. This resulted from negative feedback from lecturers, the change of the project idea, or even high individual standards that led to laziness.

"So, we didn't work less on the project because of that, but there just wasn't that intrinsic motivation anymore. Instead, the motivation was only there to put in a lot of work to get a good grade, not really because we believed in the idea." [I02-C30]

All in all, the different levels of motivation led to conflicts. One informant described situations with team members who didn't participate in discussions or were absent. The intentional absence led to massive frustration because, in the end, the work still had to be done by other team members. It was mentioned that the overall team grading just felt unfair in certain situations. To capture these instances, we build the category of neglect of work and pronounced guidelines that enhance peer frustration.

"So, each of us is somehow working on the side, and that's clear. But some people just never find a time for a meeting that works for them or always pull out. For example, if I had to work, it was like 'we won't have the meeting during that time.' And other people would say, 'Yes, we'll have the meeting, but I can't attend because I have to work.'" [I03-C61]

An important factor regarding the solution to upcoming conflicts could have been speaking up about grievances in the collaboration. Informants generally said that a lack of communication led to conflicts or that no mutual goals were communicated. Also, the behavior of the free riders was often not directly addressed and was almost tolerated. We conclude that not addressing problems leads to frustration in the team. We ascertain that problems were not sufficiently communicatively addressed to avoid personal conflicts.

"And sometimes you have it like, 'Hey, this can't be happening now. We all have so much to do, and everyone has to contribute so that we can make it.' So, there was definitely that, but I would say, in

abundance, there was more of this 'you swallow it somehow and just try to continue on your own.' And yeah, so that there isn't too much conflict in the end." [I03-C76]

Informants reported that roles changed over time to adjust the team to current project circumstances. We capture that development in challenging current team roles based on significant project changes. All in all, it was observable that no team was able to escape trouble in the collaboration. In the second-order category of emerging unstable and dysfunctional team dynamics, we subsume that. When looking at emerging conflicts, it was visible that an unbalanced task allocation was a major issue and weakened the whole team. The higher workload for some led to more stress and personal frustration.

"And in the end, it was actually just negative because I was simply annoyed. I had so much to do with all the tasks that other people hadn't done. I was stressed by it, and it caused me too much work." [I03-C57]

We hold that down in the category of uneven task allocation, which leads to more stress and dissatisfaction. Over time, patterns emerged to deal with that inequality. Informants reported that even though the whole team was aware of the unbalanced workload, it seemed impossible to interact with silent members. In a way, that behavior was accepted, and the remaining team members actively worked around that dysfunctionality.

"I think, in the end, we just accepted that she wasn't really a proper part of the group and didn't want to be, keeping herself detached. Even in the final presentation, she was mostly absent. And it was just... eventually, we accepted that she wasn't a part of the group." [I04-C126]

"Like I said, 'X' didn't really engage or participate in discussions anymore. There wasn't even a space to discuss things with her because she didn't offer any space; she completely stayed out of it. She basically ghosted us." [I04-C126]

As mentioned earlier, in other teams, it was a similar situation with the same students being

responsible for the overall progress. We observed how these teams were actively working around aware problems and dysfunctional team members. All in all, we conclude these statements in the second-order category. The relationship between dissatisfied team responsible members and alienated members pushes team division to assess the emerging split of teams. Overall, the last developed second-order categories discussed the issue of instability and experienced team division. To build the fourth aggregated dimension, we assume that a dissolution of perceived team roles might be adequate within these teams.

5 Discussion

5.1 Dynamic Model of Role- and Shared Mental Model Development

In the previous section, we described four phases of role construction and how they are initially shaped through individual skills, differing work methods, and levels of participation and how they are solidified or dissolved because of established situational awareness or dysfunctional team dynamics. This chapter introduces and explains our resulting grounded model (Figure 3) and deals with the theoretical underpinnings of SMMs and how developing them as a team leads to the construction, solidification, and dissolution of team roles. We further argue that this process determines the team's interpersonal and task-related mechanisms, resulting in either functional team dynamics and improved performance or dysfunctional team dynamics. It is necessary to mention in advance that even though some descriptions and explanations appear linear, processual, and static, we are proposing a dynamic process of simultaneously happening mechanisms.

5.1.1 Emergence of Initial Team Responsibility and Construction of (Lose) Team Roles

In educational research, learning and participation motivation is determined by intrinsic or extrinsic factors, whereas intrinsic factors are considered to be more effective. It depends on the goals students set for themselves, how much they value achieving

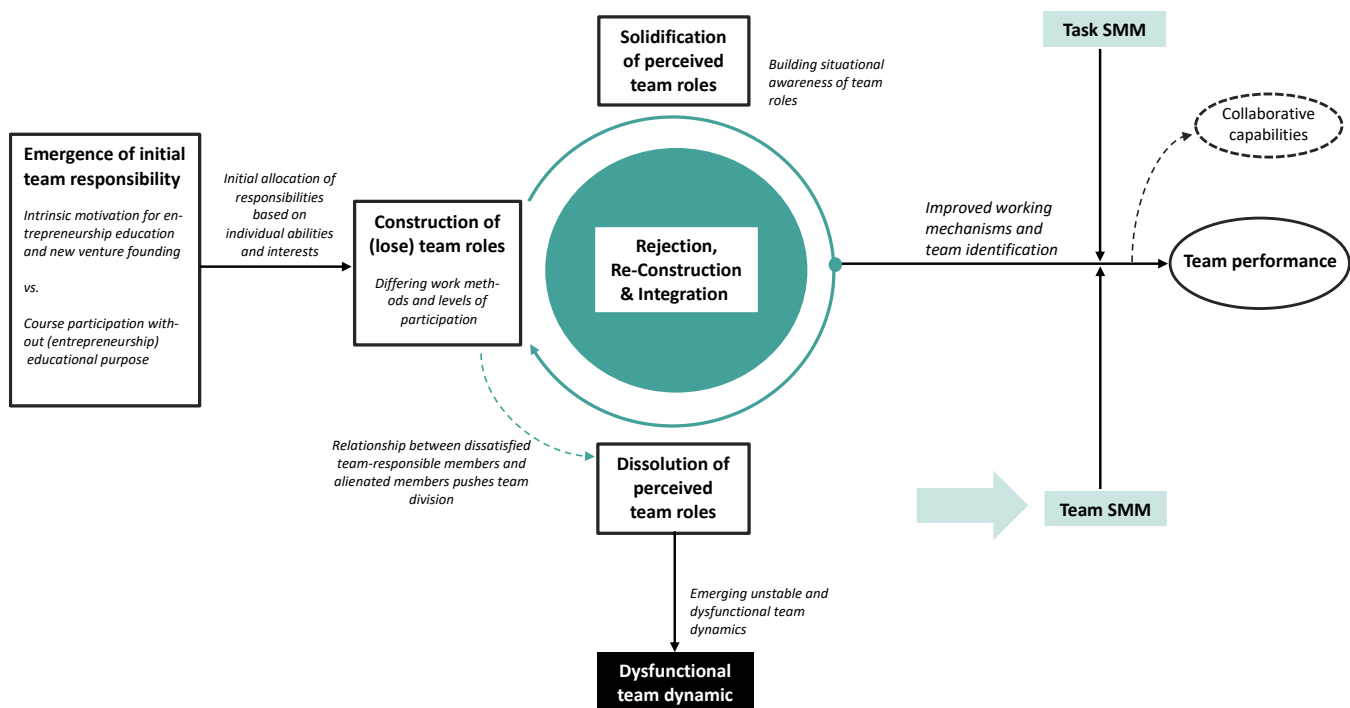


Figure 3: Grounded Model of Development of Shared Mental Models

these goals, and how they perceive the benefits of reaching their goals (Hytti et al., 2010). In other words, one's ambitions determine their motivation. In the findings, we presented that student either participated in the course based on a genuine, intrinsic interest in EE and founding a new venture or based on motives without any EE purpose. The kind of motivation and drivenness of a student determines if they will take upon initial responsibility in the team. Ambitious students, for example, set great goals for themselves and care a lot about achieving them, which results in them initially taking responsibility as they cannot risk staying behind their goals. On the other hand, students who lack intrinsic motivation are less ambitious, thus tending to lean back at first because their standards and goals do not align with those of more intrinsically motivated students.

Based upon the initial emergence of team responsibility, tasks are temporarily allocated among the team members. As they are still beginning their team development, the team members simultaneously learn about each other's behaviors, perspectives, and opinions (Uitdewilligen et al., 2018; Santos et al., 2015a). This is the first step towards developing SMMs as a team. It is further necessary for team members to acquire interpersonal knowledge at the beginning of teamwork because it enables them to situate

themselves in the team (Uitdewilligen et al., 2018). We argue that this process of positioning oneself in the team is where roles are initially constructed: The differing goals, work methods, and levels of participation of the team members result in certain individual behavioral patterns, for example, taking upon responsibility or avoiding work. These individually characteristic behavior patterns can be summarized as role behavior (Driskell et al., 2017). The team is, therefore, constructing team roles during the early stages of developing SMMs.

5.1.2 Construction, Solidification, and Dissolution of Team Roles

In general, SMM progressively evolves and improves as a team is confronted with broader knowledge and information over time, which they have to process (Uitdewilligen et al., 2018). This new information may regard new task demands, a certain task quality, or member-specific characteristics and behavior. Most team development theories agree that, especially at the beginning of the course or project, a team is still learning and figuring out its internal dynamics, relations, and task activities (Miller, 2003). They seek coherence and solidify roles (Peralta et al., 2018; Tekleab et al., 2009). According to a conceptual model developed and tested by Van den Bossch and colleagues (2010), coherence – or mutual meaning – is the foundation for SMMs. It is

developed through construction, rejection, reconstruction, and integration, which describe cognitive and behavioral mechanisms that occur when team members interact and communicate. For example, an individual statement or action is processed as the team contrasts it with their own mindset, evaluating it and building an opinion about it, which leads to a new, co-constructed meaning. This new, initial, co-constructed understanding may be rejected due to misinterpretation or personal or emotional rejection, which induces a re-construction based upon deeper, more critical discussions (Tjosvold, 2008). During this process, personal expectations, perspectives, demands, and standards are consolidated into the mutual, team- and task-related awareness, which resembles having SMMs.

Our grounded model proposes that the process of role construction, solidification, and dissolution as well as the process of constructing mental model coherence, happen simultaneously and dependently. As the team gets used to each other's working mechanisms, characteristics, and expectations of team functioning, they form new and mutual working mechanisms by continuously refining their mental models. At the same time, roles are constructed based on individual skills and knowledge as team members appear to do what they can do best first. If the roles contribute positively to the team's and the project's wellbeing, the team mutually agrees on the existence of the role and integrates it into their SMMs. In other words, the team is getting used to individual roles and develops coherence around a team role, its value, and its suitability. Suitable and thus mutually accepted roles are solidified. When the context of demands, expectations, or perspectives changes, a role can be dissolved and transformed again because the new cognitive scope needs to be processed. The construction, solidifying, and dissolving cycle starts again until the team has reached a common ground regarding their internal working mechanisms, roles, and task activities.

5.1.3 Construction of (Lose) Team Roles and Dissolution of Perceived Team Roles

Our findings showed that not every team is going through this cycle of finding coherence, building team roles, and developing SMMs. That is because the team members' work methods and levels of participation may differ so much that tasks,

responsibilities, and workload are unevenly allocated. In literature, two extremes of role behavior are identified: leadership and free-riding. Leaders take on most responsibility as they guide, coordinate, and facilitate tasks, whereas free-riders are characterized by their lack of individual effort (Chen & Agrawal, 2018; Forehand et al., 2016). Also, free-riding behavior causes more workload for the rest of the team since other team members have to compensate for it by doing more, revising and redoing work, and taking on more responsibility (Jassawalla et al., 2009).

Consequently, we argue that when these two extreme role behaviors excessively occur during initial role construction, the gap that needs to be overcome to find coherence is too large. The uneven workload allocation causes stress and dissatisfaction among the team, pushing the team's division. They cannot develop a mutual cause due to their interactions and discussions failing, thus not entering the cycle of mutual role construction. The team roles cannot be solidified since they disagree on them and do not serve team functioning. Instead, findings showed that team roles are dissolved as team members are ignored or banished. Thus, we argue that these members are excluded from further SMM development, causing the initial team's division. We used a dotted arrow here since we are discussing an exceptional case that could be further examined in subsequent research.

5.1.4 Dissolution of Perceived Team Roles and Dysfunctional Team Dynamics

When a role does not suit the team's progress and working mechanisms anymore because demands may have changed, it needs to be dissolved and re-constructed again. According to our findings, it might be the case that a team member fights the dissolution and change of their role. In the context of developing coherence, this person rejects the transformation demanded by the team's current SMMs (De Dreu & Weingart, 2003). It is possible that this person and the team cannot find a new, shared understanding and coherence regarding this issue as the person is not willing to adapt. If the team member decides to push their own agenda, relying on their role even though it does not fit the team's understanding of their role, the team's mental model is imbalanced. Every team member no longer shares the understanding of the team's

internal dynamics and roles. As several studies have shown that SMMs are significantly related to effective teamwork and functioning team dynamics (Xiang et al., 2016; Zhou & Wang, 2010; Jo, 2012), we conclude that teams that cannot reach a common sense on their roles and teamwork will suffer from dysfunctional team dynamics. Our findings suggest that the communication and interaction within such teams suffered from stubbornness, ignoring, and avoiding. However, dysfunction-al team dynamics do not mean the team quits or fails the project. It means the team's internal processes are impaired as SMMs are nonexistent.

5.1.5 Solidification of Perceived Team Roles and Team Performance

Established theories on team development conclude that to work as an effective team, it is necessary to go through a role and team transformation process that forces them to adapt and find cohesion (Bonebright, 2010). According to our results, this is achieved when team members have built consistent situational awareness of the roles and their interdependencies. This is when the team roles are retained and stabilized. As a result, team members are beginning to act according to role demands such as availability, responsibility, and quality of work. In this case, we argue that coherence and SMMs exist because external role demands and members' behavior are harmonized. This corresponds with SMM theory because, at this point, the team members have a mutual understanding of each other's roles and the environment they are acting, which enables them to estimate each other's expectations and match their behavior accordingly (Uitdewilligen et al., 2018).

Many studies concerning the effects of SMMs conclude that SMMs impact team interaction processes such as coordination, communication, and collaboration by lowering the number of misunderstandings and conflicts (Uitdewilligen et al., 2021; Xiang et al., 2016). Also, as a team has gone through the cycle of role construction, sorting out role behaviors and mutual understandings (SMMs), they pass phases that researchers consider necessary to work together effectively (Peralta et al., 2018; Bonebright, 2010). That is because they resolve task activities and inter-personal relations (Miller, 2003).

Our model complements these conclusions as we

found that solidifying and retaining team roles improves the working mechanisms and identification within a team. A team commonly finds a suitable way of working together. It is aware of internal processes and their role in them, which results in less stress, enhanced team functioning, and higher satisfaction within the team. According to Santos and colleagues (2015b), teams with SMM feel more satisfied because they can use information and knowledge efficiently to work towards a common goal.

Most researchers distinguish between task-related shared mental models (task SMMs) and team-related mental models (team SMMs). Task SMMs describe the understanding of the team's work, such as specific strategies and procedures, perceptions of the task progress, and knowledge of the contents of a task. Team SMMs, on the other hand, relate to knowledge regarding other team members individually. This means their strengths, skills, weaknesses, and the entire team structure, including team roles, role interdependencies, and communication and coordination patterns (Mathieu et al., 2000, Xiang et al., 2016). Looking specifically into these kinds of SMMs, we argue that team SMMs improve working mechanisms and team identification as the quality of interactions increases through solidified roles and a mutual understanding of interpersonal team dynamics. They reduce conflict and improve decision-making quality and coordination (van Rensburg et al., 2022). Therefore, teams with settled roles, responsibilities, and interdependencies are more coordinated and more cohesive because they are on the same page regarding their working mechanisms. Similarly, we claim that task SMMs positively influence working mechanisms because the team collectively operates along shared strategies, procedures, and goals. Having the same idea and understanding of a task avoids misunderstandings (Xiang et al., 2016; van Rensburg et al., 2022).

The overall outcome of our model and the cycle of role construction is team performance. As mentioned in the conceptual background, we define team performance as the grade given to the team for their course progress. Many studies have proven a positive relationship between task- and team SMMs as well as SMMs in general and team performance (Jo, 2012; Zhou & Wang, 2010; Xiang et al., 2016). As we argue that team roles are

constructed through creating mutual meaning and building SMMs, we conclude that having solidified team roles also increases team performance. Another reason is that SMMs and solidified team roles share the same impacts on the team's working mechanisms, which are also supposed to improve team performance (Uitdewilligen et al., 2021; Zhou & Wang, 2010). On an individual level, we conceptualized the development of collaborative capabilities as an outcome. According to Blomqvist & Levy (2006), they consist of "information processing, communication, knowledge transfer, and control" (p. 34). These skills are also essential to developing SMM because mutual meaning is constructed and re-constructed through communication and information processing (Van den Bossch et al., 2010). Moreover, collaborative capabilities are built through continuous sharing interactions (Lopez-Hernandez et al., 2018). This process resembles the co-construction process of SMMs and our theorized role construction process because it is also based upon continuous interaction. Summed up, individual team members develop collaborative capabilities during construction roles and developing SMMs as they constantly interact, communicate, and share and process new knowledge.

5.2 Theoretical Contributions

Completing the findings and discussion, we look further into how this research translates into theoretical and research-related contributions. This section showcases how we contribute to the ongoing discussion of developing team roles and teams in general and how they are connected to team performance in an entrepreneurial education context by circling back to our research gaps and questions.

We identified that current literature shows linkages between team performance and team development or certain team roles. Yet these influencing factors have only been identified separately from one another. Multiple established team development concepts (Tuckman & Jensen, 1977; McGrath, 1991; Gersick, 1989) are characterized by being static models and neglect team roles and their possible impact on teamwork (Peralta et al., 2018). We contribute to this discussion with our grounded model, which maps the cycle of individual team role development in student new venture team development. The role construction process is

modeled as a three-step cycle, which includes the phases of constructing, solidifying, and dissolving and explains how roles are shaped during the course and how the construction of individual team roles supports the development of teams. Therefore, our model offers a holistic and dynamic perspective on the interplay of team roles and -development and links the mechanics between the different role-constructing stages, possible extreme cases, and their impact on team performance.

Our study's second research contribution is the identification of SMMs as an enabling mechanic for individual team role development. Shared mental models represent a shared understanding between team members regarding the overall objective and goal of the team, the allocation of certain tasks, and the knowledge and perception of existing team roles. Mental models are linked to key elements of human behavior, needs, and actions, so they heavily influence individual motives, goals, and perceptions. For that reason, it is important to highlight their impact on social dynamics. We argue that the underlying mechanic of shared mental models is a necessity for the core development and sustainability of individual roles and a functioning team as a whole. Therefore, mental models serve as a precursor for the development of teams and explain how team roles are constructed, solidified, and dissolved.

As we touched on our dynamic, grounded model and the importance of shared mental models regarding the development of roles and teams, we moved to our third contribution, which addresses the effects of team dynamics and roles on overall team outcomes. This paper contributes to this discussion by showing that the successful development of team roles in the context of an agreed shared mental model increases overall team performance. Furthermore, we visualize that the disagreement with the shared mental model and, therefore, the dissimilar understanding of tasks and team identification leads to dysfunctional dynamics or a negative impact on the student new venture team. We add to the discussion by conceptualizing shared mental models as an explanation for how influencing factors like team development, -roles, and -dynamics impact the overall performance of a (student new venture-) team, which has yet not been addressed in the current literature. In addition, we build upon the works of Chen & Agrawal (2018), and Peralta et al. (2018) as the influence of

leadership and team cohesion on team performance, -development, and -effectiveness can be linked to shared mental models.

6. Conclusion

6.1 Summary

To summarize our study briefly, we researched the relevance of shared mental models regarding their impact on role and team development and how they influenced team performance of student new venture teams in an entrepreneurship educational setting. During our research, we constructed a dynamic model through the iterative approach based on the methodology provided by Gioia et al. (2012). This model was constructed by transforming a thoroughly derived data structure into a dynamic model that utilizes the theory of shared mental models to visualize how team roles are constructed, solidified and /or dissolved and their impact on team development and performance. With this study and model, we provide both a dynamic and a holistic perspective on the researched subject based on current team development concepts. The study helps capture the interplay between the development of team roles, observable dynamics in a changing team setting during an entrepreneurship educational course, and the effect of role construction and team development on overall team performance. We conclude this paper with shared mental models being a key mechanic and precursor for enabling the construction of certain roles and team development and, therefore, impacting team performance.

6.2 Practical Implications

After briefly reviewing and summarizing our study about team and role development within the setting of an entrepreneurship educational student new venture team course, we conclude this paper with possible implications for stakeholders. In this case, we identified students, especially student teams and educators, like professors, coaches, and instructors, as the most essential recipients of our findings. So, how does this study translate into practice?

Starting with our first stakeholder group, we will examine how to approach this subject regarding student teams, especially in an entrepreneurship educational context. Firstly, we conclude with the importance and relevance of communication and interaction between each other. Our findings show

just how essential a shared understanding of individual goals, motivation, work attitudes, and soft or hard skills are and can be for progressing the course and impacting the well-being of students. Furthermore, these highly individual nuances should be transparently clarified at the beginning of the course and before team cohesion to avoid being at cross-purposes and prevent stress and personal conflict. This topic has been addressed in this course before, yet to the degree that it did not prevent the consequences, as seen with the interviewees. Another student-team-level implication involves the transparent discussion of asserted roles within a student's new venture teams. This measure is out of reach for educators and may also clash with the course's primary objective, which is competence development and self-organization. Still, we see this point as highly relevant, and promoting this action may help the team and, thus, the overall reception and progress of the course. Students should share and give realistic estimations of their strengths, weaknesses, and soft and hard skills to fill certain gaps within the team. In addition, a more skill- or strength-orientated role allocation within the team may support more reserved individuals and overall team well-being as very responsible yet dominant team members are obliged to allocate tasks more healthily.

Progressing to the second stakeholder group, we look at possible practical implications for educators. Literature shows us that the purpose of entrepreneurship educational courses is to pursue one of many differing objectives, like to mediate essential skills, competences, and methods to utilize entrepreneurial behavior. As their nature implies that they are being designed to suit this objective, we assume the educators are policymakers and possess the power to change specific settings. Therefore, we need to take measures to build awareness to work effectively in a team. This would mean providing input sessions on team roles, teamwork, and helpful tools (e.g., project management-, mind mapping-, design-, and cloud tools) parallel to the theory and team coaching sessions, which could help newly shaped teams overcome social barriers and prevent team members of silently quitting as they are introduced to possible ways to integrate themselves. The second implication regarding educators is proposing to link the first student team implication with this one. Our own experiences and the

interviews show a risk for students to be “stuck” with certain individuals that negatively impact the course experience and grade as the course of study enables the researched course to be selected as a mandatory and elective module. Therefore, some teams include students with low motivation and responsibility and even free-riding students without a possible solution regarding the increased workload and a disadvantage for the highly motivated students. We recommend an increased promotion of communication and interaction by educators as they help to overcome difficulties and internal conflicts more efficiently as educators are capable of acting as mediators. Of course, it can be argued that this may again clash with the objective of the course and also goes against the task area of an educator. Still, as researchers and students of this course, we imply that this measure at the beginning of the course may prevent negative experiences and academic impacts (e.g., major conflicts, bad grades, and high stress levels).

6.3 Limitations and Outlook

We see this study and paper limited by the scope of considered data, the context of this study in a university education setting, and the methodology.

Firstly, our analysis relies on a data sample that includes data from one country, one university, one year of graduates, one specific course, and three participating teams in this course. As the considered data sample is tiny and highly specific, the overall scope of data limits our study. Additionally, it is essential to mention that the interview format utilized for semi-structured interviews also limits the data. Even though this inter-view form excels in offering the interviewee a safe space to open up and talk freely about the experience, they are prone to highly subjective perceptions that other team members do not testify. Furthermore, we argue that the setting in which we observed the phenomena does not reflect reality. As mentioned before, the course of study requires two mandatory majors. Yet only one is actually considered the primary study focus. Therefore, we can assume that participants of the researched course can include individuals with highly fluctuating levels of motivation regarding the completion of the course and a broad selection of differing motives for even participating. We argue that these motivation levels and differing motives cannot be compared to those who enlist and engage

in pure entrepreneurial activities and institutions like business accelerators or startups.

As mentioned in the previous paragraph, we view the semi-structured interview format as applicable but flawed. Therefore, we recommend that future research be done with multiple qualitative research methods like observations, group discussions and individual interviews with a different format over a longitudinal period to ensure a broader spectrum of available data. A second possible direction to advance research is to include and examine student teams that transitioned to a startup with their student venture. This alternative may show interesting observations compared to our motivation, motives & team dynamics data. Lastly, we argue that a quantitative study is highly interesting to measure the impact of shared mental models during team projects, including putting our dynamic, grounded model to test. In addition, we argue that applying our results onto actual new venture teams would be an interesting alternative to observe if the study can help enhance their team performance and offer them an impulse to reflect on roles and teamwork.

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