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Leadership Skills in Startups: A Quantitative Study on the Requirement Profile

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Abstract

Startups are young companies designed to grow quickly. In a highly competitive environment, leadership is a prerequisite for startup survival and an investment criterion for venture capitalists. Although entrepreneurial leadership is considered to be distinct, there is little empirical evidence on the leadership requirements faced by founders and Chief Executive Officers in startups. Against this background, an online survey was conducted on the relevance of leadership tasks and skills. 188 leaders in German startups reported on their understanding of leadership and rated 18 skills on the Occupational Information Network (O*NET) scales. The data show that startup leaders prioritize vision, strategy, and decision making over human resources and team development. The need for strategic, interpersonal, and cognitive skills is consistently perceived as high. Requirements for business skills are moderate and vary widely. The results contribute to a leadership skills model for entrepreneurs and provide implications for entrepreneurship education and training.

Keywords: competence, entrepreneurship, leadership, management, startup

1. Introduction

Startups play a vital role for the economy as they drive innovation, create new industries, and generate employment opportunities. Their dynamism contributes to economic growth, fosters competitiveness, and often leads to the development of transformative technologies and business models (Eugster& Kendzia, 2022; Hoang et al., 2022). Startups are defined by their novelty, inventiveness, and rapid growth. They are privately held small and mid-sized enterprises existing for less than a decade whose potential is based on a technology-driven, scalable business model (Churchill & Lewis, 1983; Bresciani & Eppler, 2010; Ries, 2011; Blank & Dorf, 2012; Cockayne, 2019; Men et al., 2021a; Men et al., 2021b; Jansen et al., 2023).

Startups develop in complex and uncertain conditions (Sommer et al., 2009; Ries, 2011) and are at high risk of failure (Aldrich 1999; Aldrich & Yang, 2012). The mortality rate of startups is close to 90% (Bednár & Tarišková, 2017; Aminova & Marchi, 2021). Startups are often considered flexible and dynamic (Pellegrino et al., 2012), despite their lack of experience, resources, and formal structure (Rode & Vallaster, 2005; Timmons & Spinelli, 2008; Sommer

et al., 2009; Freeman & Siegfried, 2015; Zaech & Baldegger, 2017; Joshi & Achutan, 2018; Sundermeier et al., 2020; Men et al., 2021b). Effective leadership is considered essential for the survival and performance of startups, as founders cannot rely on well-defined goals, standard operating procedures, or established governance structures (Bryant, 2004; Ensley et al., 2006; Haynes et al., 2015; Zaech & Baldegger, 2017; Dvalidze & Markopoulos, 2020; Eisenman, 2021; Boni, 2022).

Entrepreneurial leadership involves creating visionary scenarios to assemble and mobilize supportive followers who are committed to discovering and exploiting strategic value creation (Gupta et al., 2004). In the startup context, leadership requires coping with unstable, unpredictable environments and fluid patterns (Timmons & Spinelli, 2008; Freeman & Siegfried, 2015). Startup leaders face a range of challenges, including the need to create a compelling vision, set goals, and communicate strategies effectively. They must collaborate effectively, motivate people, and inspire diverse teams (Watkins, 2004; Antonakis & Autio, 2007; Kuratko, 2007; Timmons & Spinelli, 2008; Zenger & Folkman, 2014; Giles, 2016; Zaech & Baldegger, 2017; Fioravanti et al., 2021; Men et al., 2021b). During the process of navigating chaos, constructing structures, and allocating limited resources (Watkins, 2004; Timmons & Spinelli, 2008; Freeman & Siegfried, 2015), leaders of startup companies must foster innovation and establish opportunities for continuous growth (Timmons & Spinelli, 2008; Renko et al., 2015; Jansen et al., 2023).

These tasks and expectations are directed towards the founder or founding team themselves (Rode & Vallaster, 2005; Freeman & Siegfried, 2015). For startups, the leadership competence of key decision-makers is a critical success factor (Cooper & Bruno, 1977; Duchesneau & Gartner, 1990; Swiercz & Lydon, 2002; Cogliser & Brigham, 2004; Ensley et al., 2006; Zaech & Baldegger, 2017; Dvalidze & Markopoulos, 2020; Prommer et al., 2020; Santisteban et al., 2021; Sevilla-Bernardo et al., 2022). Venture capitalists consider the potential of the team as well as leadership aspects when making investment decisions (Gompers et al., 2020). Therefore, leadership competence is a valuable asset for startups.

Startups require leadership development due to their tendency to employ young and inexperienced staff. Structures and routines that could serve as leadership substitutes are often underdeveloped (Ouimet & Zarutskie, 2014; Prommer et al., 2020). Moving beyond the initial phase and rapidly scaling a venture "is a different leadership game" (Timmons & Spinelli, 2008, p. 555). During the growth phase, founders often overlook the need to nurture their teams and become excessively involved in operational aspects (Freeman & Siegfried, 2015). A significant number of startup failures are associated with breakdowns in communication between founders and staff (Hess, 2012). As companies expand, founders need to evolve in their leadership roles. However, some founders lack the necessary skills to transition into the role of Chief Executive Officer (CEO) (Swiercz & Lydon, 2002; Freeman & Siegfried, 2015; Picken, 2017).

Scholars suggest that leadership development could benefit decision makers (Peterson et al., 2009; Holmberg-Wright & Hribar, 2016) and help reduce the high failure rate of startups. However, leadership development is often overlooked in the startup ecosystem (Watson & Scott, 1998; Zaech & Baldegger, 2017; Prommer et al., 2020).

In addition, there is a lack of clarity regarding the specific leadership competences that are necessary for startup entrepreneurs to perform effectively. Existing leadership competence frameworks do not consider that entrepreneurial leadership requires a modified approach (Renko et al., 2015; Harrison et al., 2016; Dvalidze & Markopoulos, 2020). Competence frameworks do provide a detailed spectrum of leadership skills (Wallace et al., 2021). However, there is no competence profile for the narrower field of startup leadership that could

serve as a starting point for training design. Research on entrepreneurial leadership lacks a firmly established empirical foundation (Harrison et al., 2016). As far as is known, there is no validated leadership skills model for entrepreneurs.

This study aims to contribute to the dissemination of leadership development in startups by exploring the competences that leadership training should address in such high-growth ventures. The study refers to the leadership skills approach introduced by Katz (1955) and developed by Mumford et al. (2000). Both models assume that leaders can acquire the competences they need to perform their tasks. Competence allows leaders to fulfill their job demands and roles (Parry, 1996; Burgoyne, 1989). Mumford and colleagues' leadership strataplex model (2007) comprises cognitive, interpersonal, business, and strategic skills. It served as a theoretical framework for a quantitative survey on leadership requirements in startups. The survey investigated the importance of different leadership tasks for executives in startups and assessed the leadership competences demanded by startup founders and CEOs.

Traditional leadership research does not fully explain the dynamics of leadership in startups at different stages of development (Dvalidze & Markopoulos, 2020). This paper presents a quantitative study on leadership skills in startups, highlighting the significant demands placed on startup leaders. The study also identifies methodological challenges and a need for further investigation.

2. Methodology

A quantitative study on leadership requirements was performed surveying founders and executives of startups based in the Berlin-Brandenburg and Munich metropolitan regions, Germany, which are the regions with the highest number of startup formations nationwide (IfM, n.d.; Startupverband, 2023). The sampling was based on a database that utilized qualified commercial register data on startups. A total of 4,222 startups were contacted via email, and 290 executives were personally invited to take the online survey. The survey was also promoted on social media.

Participants selected themselves through a text link and provided informed consent. Data was collected anonymously through a survey conducted from August 1 to September 15, 2023. A total of 241 participants responded, resulting in a response rate of 5.7%. The dataset was cleansed by excluding respondents from startups founded before August 1, 2013, adhering to startup definitions with a 10-year cutoff point post-establishment. The study excluded cases that lacked at least one response to competence-related questions. The final dataset included 188 cases, representing startup executives. It is important to note that the study is not representative in terms of the companies and respondents.

Of the participants, 80.3% are founders. The respondents are affiliated with startups that are less than 4 years old by 53.5%. In 2022, 87.9% of the startups represented in the sample had no more than 24 employees. The average annual revenue in 2022 was 3.6 million Euros, while the median annual revenue was 350,000 Euros. The study's metrics suggest that the analyzed startups are in early development, defined as the first three years after incorporation, with fewer than 25 employees and annual revenues below 3 million Euros (Timmons & Spinelli, 2008).

Following the approach of Mumford et al. (2007), who examined the cognitive, social, business, and strategic skill requirements for government employees at various levels of hierarchy, leadership skill requirements were measured using the Occupational Information Network (O*NET) scales developed by the U.S. Department of Labor. The O*NET is a job analysis system and taxonomic skills model that categorizes occupations systematically. The comprehensive framework utilizes scales to outline skill requirements at different levels of

specificity and facilitates a nuanced understanding of job characteristics and skill sets (Dye & Silver, 1999; Mumford et al., 1999; Peterson et al., 2001).

The level of skills required to perform the role of startup executives was rated by the respondents on 7-point Likert scales. Behavioral anchors were provided for the high, medium, and low points of each scale. For instance, the anchors for the coordination scale were "schedule appointments for a medical clinic" (low), "work with others to put a new roof on a house" (medium), and "direct a project requiring coordination between multiple subcontractors" (high). The participants were informed that the anchors were indicative of the skill level, although the specific example might not be applicable to the startup environment. To assess the internal consistency of the subscales for cognitive, social, business, and strategic skill requirements, Cronbach's alpha (α) was calculated for reliability analysis.

Cognitive skill requirements were assessed using six items including: speaking (talking to others to convey information effectively), active listening (giving full attention to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times), writing (communicating effectively in writing as appropriate for the needs of the audience), reading comprehension (understanding written sentences and paragraphs in work-related documents), active learning (understanding the implications of new information for both current and future problem-solving and decision-making) and critical thinking (using logic and analysis to identify the strengths and weaknesses of different approaches). The internal consistency reliability is .76.

Interpersonal skill requirements were assessed using four items including: Social perceptiveness (being aware of others' reactions and understanding why they react as they do), coordination (adjusting actions in relation to others' actions), negotiation (bringing others together to reconcile differences), and persuasion (persuading others to change their minds or behavior). The internal consistency reliability is .69.

Business skill requirements were measured using four items including: management of personnel resources (motivating, developing, and directing people as they work, identifying the best people for the job), management of financial resources (determining how money will be spent to get the work done, and accounting for these expenditures), management of material resources (obtaining and seeing to the appropriate use of equipment, facilities, and materials needed to do certain work), and time management (managing one's own time and the time of others). The internal consistency reliability is .70.

Strategic skill requirements were measured using four items including: complex problem solving (identifying complex problems and reviewing related information to develop and evaluate options and implement solutions), judgment and decision making (considering the relative costs and benefits of potential actions to choose the most appropriate one), system analysis (determining how a system should work and how changes in conditions, operations, and the environment will affect outcomes), and systems evaluation (identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system). The internal consistency reliability is .79.

3. Results

When asked about the three most important leadership tasks, over three-quarters of respondents prioritize vision and strategy. Two-thirds of respondents point to decision-making and problem-solving. Tasks related to interpersonal exchange with staff or other stakeholders are clearly less important (see Table 1).

The survey assessed the level of requirements for cognitive, interpersonal, business, and strategic skills. Table 2 reports the descriptive statistics for the four scales. The range of leadership skill requirements is from 4.65 to 5.57, with standard deviations ranging from .19 to .55.

Table 1: Descriptive Statistics for the Top 3 Leadership Tasks

Leadership Tasks	Frequency of Responses	Percentage of Responses	Percentage of Cases
Vision and Strategy Development	147	28.5	78.2
Decision Making and Problem Solving	122	23.6	64.9
Communication	84	16.3	44.7
Employee Management and Motivation	69	13.4	36.7
Team Development	61	11.8	32.4
Self-leadership	33	6.4	17.6
Total	516	100.0	274.5

Note. Results are based on 188 respondents who were allowed to select up to three options.

Table 2: Descriptive Statistics for Requirements in Leadership Skill Domains

Skill Domains	Mean	SD	n
Cognitive Skill Requirements	5.41	.259	180
Interpersonal Skill Requirements	5.45	.284	179
Business Skill Requirements	4.65	.553	172
Strategic Skill Requirements	5.57	.187	175

The limited range of mean values is common for homogeneous groups or situations where participants share similar characteristics, experiences, or backgrounds. There is a high level of agreement in the evaluation of cognitive, interpersonal, and strategic skill requirements. The assessments of business skill requirements show the greatest differences, although these differences are still moderate.

The respondents' assessment is most consistent in the area of strategic skills, which have the highest requirements. The requirements for strategic skills are perceived as relatively uniform. In contrast, cognitive and interpersonal skill requirements have lower values, but their requirement level is still considered very high or high. The required level for business skills is moderate and clearly lower than the level required for strategic skills.

The study investigated individual competences within the competence areas. Table 3 reports descriptive statistics for the 18 sub-scales. The leadership skill requirements range from 4.00 to 5.84, with standard deviations ranging from .95 to 1.5.

Table 3: Descriptive Statistics for Leadership Skill Requirements

Skill Requirements	Mean	SD	n
Cognitive Skill Requirements			
Speaking	5.44	.958	180
Active Listening	5.53	1.070	180
Writing	5.02	1.035	180
Reading Comprehension	5.29	1.155	180
Active Learning	5.80	.960	180
Critical Thinking	5.39	.948	180
Interpersonal Skill Requirements			
Social Perceptiveness	5.17	1.027	179
Coordination	5.84	1.029	179
Negotiation	5.33	1.179	179
Persuasion	5.46	1.113	179
Business Skill Requirements			
Management of Personnel Resources	4.41	1.501	172
Management of Financial Resources	5.20	1.350	172
Management of Material Resources	4.00	1.479	172
Time Management	5.01	1.379	172
Strategic Skill Requirements			
Complex Problem Solving	5.55	1.070	175
Systems Analysis	5.41	1.125	175
Systems Evaluation	5.49	1.066	175
Judgment and Decision Making	5.83	1.062	175

The assessment of the requirements for business skills differs the most in terms of the requirements for personnel management.

The competences of coordination, judgement and decision making, active learning, and complex problem solving are subject to the highest demands. On the other hand, respondents feel less challenged when it comes to managing material and personnel resources, as well as time management. Additionally, almost all requirements for individual business skills are lower than those for other competences. According to executives, the ability to perform strategic tasks is more important than skills in management tasks.

4. Implications

Startup founders and executives operate at an overall high level of demands, with a notable emphasis on strategic tasks and associated competences. There is a significantly lower level concerning business skills, and respondents' assessments reveal substantial individual differences in this regard. The low level of interpersonal demands may be due to small team sizes. However, leadership is still relevant for startup performance even within founding teams

and shared leadership structures (Ensley et al., 2006). It is possible that startup executives underestimate the importance of interpersonal competence (Freeman & Siegfried, 2015).

Entrepreneurial and managerial skills are distinct from each other. The results confirm this view from a startup perspective. Entrepreneurial skills focus on identifying and capitalizing on opportunities, creativity, risk-taking, and innovation. Management skills, on the other hand, emphasize organizing, planning, coordinating, and controlling established processes and resources within an existing structure (Botha et al., 2015; Reis et al., 2021).

The results confirm the need to distinguish between leadership and management as separate concepts. Management skills are necessary for achieving goals and solving problems to accomplish the mission. On the other hand, leadership skills are used to identify potential opportunities and navigate uncertainty, providing direction and aligning individuals with a common vision (Zaleznik, 1977; Kotter, 1990).

Compared to a study by Mumford and colleagues (2007) among government employees, which also utilized O*NET scales, the strategic skill requirements are higher in the entrepreneurial context. Interpersonal and business skill requirements are similar, while cognitive skill requirements are lower in startups. Additionally, executive assessments of requirement levels are more consistent in startups than in public authorities. In line with the idea that leadership is contextual (Antonakis & Autio, 2007), the results of this study suggest that there are unique demands not only for entrepreneurial leadership in general, but also for leadership in new ventures.

The findings regarding the importance of decision-making and other personal skills are relevant to entrepreneurship education and training, even though they are not explicitly addressed. Such skills are often neglected for professional and methodological knowledge (Garavan & O'Cinneide, 1994; Lackéus, 2015). This study suggests that it is important to tailor leadership development programs in order to address these specific categories of skills.

The presented data is based on subjective assessments from the respondents. Additionally, the requirements profile does not consider the employee perspective on leadership. This methodological approach does not align with modern views of leadership, which consider the dynamics between managers and their followers (Uhl-Bien et al., 2014).

The study has limitations due to the lack of a clearly definable population and self-selection of participants. Additionally, the sample size is small. Management surveys typically have response rates that do not exceed 30%, even with sophisticated methods (Cycyota & Harrison, 2006). Surveys among entrepreneurs have response rates between 35% and 40% (Rutherford et al., 2017; Scheaf et al., 2022). Mail surveys among small business owners yield average response rates of around 30% (Dennis, 2003). Web survey response rates are known to be lower by up to 12 percentage points (Daikeler et al., 2020). Despite the survey being conducted during the holiday season, the achieved response rate of 5.7% fell significantly below expectations. Accessing the field is considered difficult by experts, as German startups are frequently the target group of large-scale studies and student papers.

The sample size is insufficient, and the data collected on company characteristics is incomplete, making it unreliable to classify the represented startups into size categories. Therefore, it is not possible to conduct reliable correlation analyses that shed light on how size characteristics or phases in the startup life cycle influence the leadership requirement profile.

Critics have pointed out methodological shortcomings and lack of practicability in the O*NET scale (Handel, 2016). Although it has been used in leadership research before (Mumford et al., 2007), the current version of the scale no longer includes the important entrepreneurial skill of visioning (refer to Peterson et al., 2001, p. 465). The narrow range of mean values suggests

that the scale may not be sensitive enough to capture subtle differences in participants' assessments.

The questionnaire demonstrated acceptable internal consistency for cognitive, business, and strategic skill requirements, with achieved values of ≥ .70 (Cicchetti, 1994; Taber, 2018). However, the internal consistency for interpersonal skill requirements was questionable. It is worth noting that scales consisting of fewer than 10 items usually underestimate reliability (Taber, 2018). Nevertheless, the leadership model by Mumford and colleagues (2007) exhibited higher and excellent internal consistency throughout. This implies that the O*NET scale may not be entirely appropriate for entrepreneurial leadership and may require some modifications.

This study presents initial empirical insights into the leadership profile requirements of executives in startups and the importance of leadership competences. It also identifies a need for further research to develop a leadership skills model tailored to entrepreneurs and to put leadership in startups on a theoretically sound base. Additionally, the study highlights the significance of developing accurate measurement scales to evaluate leadership abilities in the field of entrepreneurship. Starting a business requires a unique set of skills that differ from those needed to expand it (Picken, 2017; Churchill & Lewis, 1983; McFarland, 2008; Freeman & Siegfried, 2015). The relationship between the phases in the startup life cycle and the significance of individual leadership competences, particularly in the design of leadership development, remains an unresolved research question.

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