

The development of a methodology for assessing teamwork and sustainable quality culture, focusing on top management teams

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Abstract

Purpose – The purpose was to present a developed, tested and evaluated methodology for assessing teamwork and sustainable quality culture, focusing on top management teams (TMTs).

Design/methodology/approach – The developed methodology was based on a convergent mixed-method design, including two data collection methods: questionnaire and focus group discussion. Two pilot tests were performed with two TMTs. This design involved analysing, merging and interpreting data, first separately by data collection method and theme and then in a meta-interpretation. Lastly, there was a follow-up meeting for evaluating results.

Findings – Findings from the study were that the methodology can be used to assess teamwork and sustainable quality culture, and the results also showed the strength of using two data collection methods to provide a broader picture of teamwork and sustainable quality culture. A follow-up meeting validated the results and provided additional value to the two TMTs in the form of suggestions on how to improve their teamwork and sustainable quality culture.

Practical implications – Applying this methodology can guide TMTs in how to improve their teamwork and sustainable quality culture within their organisations.

Originality/value – This is a new methodology, containing a developed questionnaire and an interview guide, aiming to assess and evaluate teamwork within TMTs and sustainable quality culture. The practice of the methodology adds value to both TMTs and their organisations, as well as provides a theoretical and methodological contribution to research on teamwork and sustainable quality culture.

Keywords Methodology, Sustainable quality culture, TMT, Teamwork, Top management team

Paper type Research paper

1. Introduction

Quality management (QM) is based on systematic efforts to improve an organisation's processes and results to satisfy customer needs (e.g. Bergman and Klefsjö, 2020; Gremyr *et al.*, 2020). Teamwork is an important part of QM (e.g. Dean and Bowen, 1994; Hackman and Wageman, 1995; Dahlgaard, 1999; Daily and Bishop, 2003).

A challenge facing organisations today is how to adapt to continuously changing environments (Fundin *et al.*, 2018). Due to the demanding and complex nature of today's organisations and changing environments, working in teams has become more relevant than ever (Richardson, 2011; Kozłowski and Ilgen, 2006). Within organisations or in cross-organisational



collaboration, workers are often divided into teams to make them more effective, flexible and adaptable for solving complex problems (e.g. Kozlowski and Ilgen, 2006; Thompson, 2004). Thus, working in teams has become more common and a growing shift can be seen towards this structure of work. This has made teams and team effectiveness an organisational concern (Kozlowski and Ilgen, 2006).

Previous research shows that leadership is a crucial element of team effectiveness and performance (e.g. Cohen and Bailey, 1997; Colbert *et al.*, 2014; Hambrick *et al.*, 2015) and that a top management team (TMT) is a key resource in an organisation's sustainability (Xu *et al.*, 2019). According to Gremyr *et al.* (2020), quality is defined by customers, an argument also stated by Juran, while TMTs are responsible for the commitment to quality within an organisation. Thus, how successful an organisation will be in achieving sustainable results and performance is especially dependent on the TMT. The effectiveness of TMTs was already a point of discussion in the 1990s. For example, Katzenbach (1998) stated that TMTs rarely worked as or constituted "real" teams. Katzenbach and Smith (2016) defined a real team as "a small number of people with complementary skills who are equally committed to a common purpose, goals, and working approach for which they hold themselves mutually accountable. Real teams are a basic unit of performance" (p. 90). That TMTs seldom operate as real teams may be a consequence of their composition; they often consist of leaders from different departments within an organisation focusing on their own department's performance and therefore operating in silos. When members of TMTs are focusing on their own functional areas, the organisation becomes fractionated and ineffective (West, 2012). Hambrick (1997) described the reality of TMTs as simply constellations of "strong players", who rarely meet as a team, often do not share the same views and exhibit self-centred behaviour. Katzenbach and Smith (1993) stated that "teams at the top are the most difficult (to achieve) but also the most powerful" (p. 118).

Much research has focused on the relationship between working with quality and quality improvements and an organisation's financial performance [See for instance, Boulter *et al.* (2013), Eriksson *et al.* (2003), Hansson and Eriksson (2002) and Hendricks and Singhal (1999)]. Quality work is often guided and led by TMTs and interactions between individuals within the organisation, both leaders and co-workers. This interplay between individuals in the organisation creates the organisational culture. Bergman and Klefsjö (2020) argue that QM should be based on a culture grounded in a number of quality core values, and Schein (2009) states that culture and leadership are intertwined – "two sides of the same coin" (p. 3). Both sides need to be understood at all levels of the organisation. A culture that supports creativity and innovation is crucial in encouraging teams to express and implement unique approaches and ideas (Richardson, 2011). Quality and a quality culture are results of how leadership is enacted and how teams and their members interact. To achieve sustainable performance in a changing context, teams and leaders need to have the skills of long-term thinking (Mårtensson, 2022). Thus, in this paper, a quality culture is seen as one that promotes sustainability from a long-term perspective, a sustainable quality culture. This article is focusing on teamwork in TMTs in relation to sustainable quality culture in an organisation.

The authors' logical chain of thoughts can be summarised in the following challenges: Teamwork is expected to increase efficiency in complex working tasks requiring the participation of several individuals. Many of the tasks that a TMT has require the cooperation of several individuals. These working tasks could therefore be considered as complex. Members of a TMT are also role models in making the quality culture in an organisation. How the members of the TMT are acting and behave, influence the whole organisation. TMTs that work as teams are therefore expected to have a higher capacity to create a good and sustainable quality culture in their organisations. Therefore, it is

interesting to study teamwork in TMTs in relation to sustainable quality culture. In summary, there seems to be a logical chain of thoughts linking leadership, TMTs, teamwork and sustainable quality culture. Further, as the authors cannot find any research related to assessing teamwork in TMTs and sustainable quality culture, there seems to be a gap in existing research.

- (1) The purpose of this paper is therefore to present a developed, tested and evaluated methodology for assessing teamwork and sustainable quality culture, focusing on TMTs.

2. Theoretical background

2.1 Teams and teamwork

There is no unified definition for the concept of a team. However, in studying previous research some distinct characteristics of teams appear. To summarise, a team can be defined as a bounded set of individuals (two or more) who perceive themselves and are perceived by others as a clearly defined social unit with a clear and accepted common purpose and objective(s) (e.g. Tannenbaum and Salas, 2020; Hackman, 2002; O'Leary *et al.*, 2011). A team consists of members with different roles and responsibilities who operate interdependently to fulfil a common purpose and objective(s) (e.g. Gremyr *et al.*, 2020; Katzenbach and Smith, 2016; Salas *et al.*, 2015; Woods and West, 2010) and outcome and who regularly communicate with each other with the aim of adapting their behaviours to function better collectively (e.g. Kock, 2007; Lyubovnikova *et al.*, 2014). They are "together embedded in an encompassing organisational system with boundaries and linkages to a broader system context and task environment" (Kozlowski and Ilgen, 2006, p. 79).

Some of these groupings are known as "real" teams (Hackman, 2002; Katzenbach and Smith, 1993). According to Hackman (2002), a real team requires three elements: the members have a shared task, the team boundaries clearly state who is included in the group and the group membership is stable. Katzenbach and Smith (1993) state that five elements are required to fulfil the definition of a real team: size, purpose and goals, skills, working approach and mutual accountability. Other requirements mentioned in the literature are that members of a real team identify themselves as being a member of a team, their team task require them to work closely and interdependently towards a common objective, clear and specified roles, mandate to decide how to carry out team tasks and regularly meetings to reflect, communicate and review team processes (Richardson, 2011; Lyubovnikova *et al.*, 2014). In this paper is a real team seen as a team that possesses eleven prerequisites or capacities for acting as a real team. These prerequisites or capacities are: team communication, team competences and learning, team composition, team context, team culture, team flexibility and adaptability, team leadership and team decision-making, team purpose and objective, team reflexivity and continuous improvements, team roles and responsibilities and team task and coordination.

There can be different types of teams within an organisation. One example is a TMT, which can be defined as "a relatively small group of most influential executives at the apex of an organisation – usually the CEO (or general manager) and those who report directly to him or her" (Finkelstein *et al.*, 2009, p. 10). One way of enhancing strategic leadership effectiveness in a complex organisation can be to encourage senior executives to choose team processes and compositions adapted for specific situations (Edmondson *et al.*, 2003). Edmondson (2013) refers to the concept of "teaming", emphasising the process of interaction over the design and structure of teams. Teaming is like a process – "teamwork on the fly" (p. 44). Teaming is flexible and adaptable to new circumstances.

2.2 Organisational culture, quality culture and sustainable quality culture

The culture of an organisation can be understood through the perspective of three levels (Schein, 2009). The first level is artefacts, which includes visible organisational structures and processes. The second level is espoused values, which are strategies, goals and philosophies that exist in the organisation and create an image of the organisation. The third level is underlying assumptions, a deeper level grounded in the history of the organisation that includes the essence of culture instilled through common learned values and beliefs that have become taken for granted.

There is an array of definitions of organisational culture. Schein (2009) defines culture as “a pattern of shared tacit assumptions that was learned by a group as it solved its problems of external adaption and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation those problems” (p. 27).

Bergman and Klefsjö (2020) state that an organisational culture is formed by common core values or cornerstones and cannot exist without working methods and tools that efficiently support these core values. The authors also present a theoretical model consisting of six cornerstones: focus on customers, base decisions on facts, focus on processes, improve continuously, let everyone take an active part and develop committed leadership (Bergman *et al.*, 2022).

The values or cornerstones that form a quality culture are mutually dependent on each other and have to be viewed as a system in combination with working methods and quality tools (Bergman and Klefsjö, 2020). A sustainable organisational culture is one of the most important intangible assets and drivers of competitiveness for organisations (Štreimikienė *et al.*, 2021).

2.3 TMT, teamwork and sustainable quality culture

The core of leadership is creating and maintaining an organisational culture, and how managers behave has a significant impact on the creation of organisational culture (Schein and Schein, 2016). In a similar way, Štreimikienė *et al.* (2021) state that leadership is an effective tool for forming an organisation’s culture. According to Ingelsson (2013), “managers need to be present among their co-workers and aware of how their own actions affect the possibility to build a strong Quality Management culture” (p. 77). Thus, the role of managers, and specifically TMTs, has a significant influence on an organisation’s culture. An important aspect of leadership is the ability to shift an organisational culture towards sustainability (Neculaesei *et al.*, 2019). However, individual leaders cannot easily create or change cultures because they are part of the organisation (Sharma and Jain, 2013). Change takes time and has to involve the organisation as a whole.

A TMT directly affects the competitiveness and future sustainability of an organisation, since it is at the heart of decision making and development (Xu *et al.*, 2019). A TMT has an important role in developing an organisation’s culture and the mindset regarding system thinking and sustainability. This is in line with Štreimikienė *et al.* (2021), who argue that “high culture organisations” identify and foster values of sustainable development and strive towards sustainable development objectives.

In their review of previous research, Naranjo-Valencia *et al.* (2016) found an assumption that culture is directly related to performance, as culture influences behaviour within organisations. Teamwork was strongly associated with organisational performance. Petty *et al.* (1995) stated that an organisational culture that emphasises teamwork is more conducive to organisational effectiveness than one that does not foster cooperative behaviours. Behaviours such as working as a team seemed to enhance performance in the aggregate for the studied organisation (Petty *et al.*, 1995).

3. Research design

The development of this new methodology follows a convergent mixed method design inspired by [Creswell and Creswell \(2018\)](#) and [Creswell and Plano Clark \(2017\)](#). It is defined as convergent because two different data collection methods are used almost parallel to deepen knowledge in accordance with the purpose of the study (see [Figure 1](#)).

The purpose of this new methodology is not to provide a tool for comparison between TMTs, but to improve and develop their own capacity and understanding of how to work as a team alongside with sustainable quality culture. For that purpose, a convergent mixed method design is suitable.

The developed methodology is presented under the section Findings.

3.1 Literature review

Initially, a literature review was conducted to investigate existing research on teamwork and sustainable quality culture. Searches were carried out using search terms as: top management team, management team, TMT, top level management, senior management, senior leadership team, senior executive (leadership), quality culture and sustainable quality culture. Searches were made in databases as: Scopus, Web of Science and Business Source. Criteria for including articles that were further scanned were: English language, peer reviewed articles and full text. Selected results were scanned against the purpose for this paper. Another base and inspiration of relevant literature was a previous conducted scoping review aiming to explore what success factors and characteristics are described in literature regarding to how TMTs manage organisations towards sustainable quality development ([Sten et al., 2022](#)). Additional searches were also made from citation searching. Results from reviewing the literature served as a base for developing a questionnaire and an interview guide.

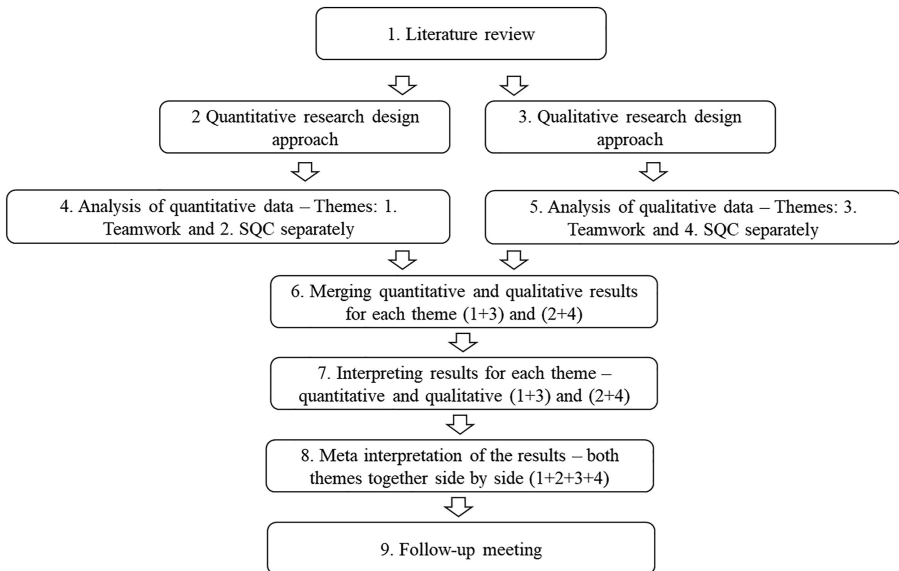


Figure 1. Following a convergent mixed method design for developing a methodology to assess teamwork and sustainable quality culture, focusing on TMTs

Source(s): Figure by authors

3.2 Quantitative research design approach

Previous research has provided various quantitative instruments for measuring teamwork; see, for instance, Richardson (2011) and Wheelan (2016). The quantitative research approach of this study took the form of a developed questionnaire including two themes: teamwork and sustainable quality culture. This new assessment tool focuses on the relationship between teamwork and sustainable quality culture and represents a novelty within existing research regarding quantitative measurement instruments for teamwork and quality culture. This new questionnaire was developed in three steps:

- (1) *Development of the questionnaire* – The developed questionnaire included 57 statements in total (See Appendix 1), eighteen of which related to teamwork (the first part of the questionnaire). The second part of the questionnaire was compiled from existing questionnaires used for assessing sustainable quality culture. These questionnaires have been used and tested in different settings and contexts (See for instance, Ingelsson *et al.*, 2018; Ingelsson and Bäckström, 2017; Bäckström and Ingelsson, 2015, 2016; Ingelsson and Mårtensson, 2014). The second part of the questionnaire covered aspects of sustainable quality culture (i.e. long-term and sustainable thinking and system view) and included 39 statements. These statements were grouped into nine factors [1] and six dimensions based on previous research. Two factors, *Develop Committed Leadership (including dimensions: Empathy, Presence and communication and Integrity)* and *Let everyone take an active part (including dimensions: Development, Influence and Being informed)*, consisted of three dimensions per factor, similarly as in previous versions of the questionnaire. This new version of the questionnaire was titled “Assessing Teamwork in Top Management Teams and Sustainable Quality Culture”.

A seven-point Likert agreement scale, ranging from “Agree strongly” to “Disagree strongly”, was used to assess the statements. “Do not know/do not want to answer” was also included as a possible response.

- (2) *Internal testing and adjustments* – Before distributing the new questionnaire to respondents for external testing, it was read through and tested by seven members of the subject matter group Quality Technology and Management. The purpose of the internal test was to improve the questionnaire by making it more user-friendly and understandable for respondents. Some adjustments were made, including the order of the statements, spelling and formulation of some statements. The electronic survey tool Netigate (webb version) was used to distribute the questionnaire. This survey tool is an approved cloud service at the university.
- (3) *External testing* – The electronic questionnaire was then tested by two TMTs from two different organisations in Sweden who had previously expressed interest in participating in the current research study. Survey data were collected during April 2022.

Both participating TMTs consisted of seven members and included leaders and other professionals, such as controllers and business developers.

Participants were informed both verbally and in writing about the study, confidentiality and their rights to withdraw their participation without the need to give any reason. The response rate for the electronic questionnaire was 100% for both TMTs.

3.3 Qualitative research design approach

Focus group discussions were used to complement the questionnaire, aiming to provide deeper knowledge and understanding of respondents’ perceptions of teamwork and

sustainable quality culture. An interview guide was developed and built on the two themes, teamwork and sustainable quality culture (See [Appendix 2](#)). This interview guide was developed in three steps:

- (1) *Development of the interview guide* – The interview guide started with an introduction to the purpose of the study, the researchers' background and ethical principles regarding participation in the study. Questions were then presented divided into the two themes: teamwork and sustainable quality culture (the same themes as for the questionnaire). The last part of the interview guide gave the respondents an opportunity to provide reflections on the interview, describe their experience of the questionnaire and offer suggestions for how to improve the questionnaire and focus group discussion.
- (2) *Internal testing and adjustment* – Before conducting focus group discussions, the interview guide was read through carefully by the authors. Some adjustments were made, including the order and formulation of some questions. The purpose of this internal test was to improve the guide before using it for external testing.
- (3) *External testing* – Two focus group discussions were conducted digitally with the same respondents as answered the questionnaire. All members from the two different TMTs participated. Each focus group discussion was digitally recorded and lasted about 60 min. Participants were informed both verbally and in writing about the study, confidentiality and their right to withdraw their participation without the need to give any reason. The focus groups were managed by the researchers to ensure that all participants had the opportunity to speak. Both interviews followed the structure of the developed interview guide and were conducted in the beginning of May 2022.

The authors met for a short reflection after each focus group discussion. The purpose of this meeting was to identify possible improvements to the interview guide and interview technique and to discuss results from the interview and to reflect on the respondents' actions and the interactions within the group.

3.4 Analysis of quantitative data

The results from the two questionnaires were analysed using Statistical Package for Social Sciences (SPSS, version 29.0.0.0 241) This is a statistical analysis program for which the university has a license. As there were few respondents per group, no deep statistical analysis could be conducted with reliable results. The statistical analyses that were carried out were conducted according to the following three steps:

- (1) *Minimum, maximum, mean and standard deviation* – Minimum, maximum, mean and standard deviation values for all eighteen statements about teamwork and for the nine factors and six dimensions relating to sustainable quality culture were calculated. This was done for each respondent group. The focus of the analysis was to assess the differences in the minimum and maximum values rather than extract exact values for mean and standard deviation. However, mean, and standard deviation values could provide an indication of the results for the respondent groups.
- (2) *Categories and differences* – The authors categorised each statement according to the mean value. If the mean was 3.99 or lower it was categorised as low, and if the mean was six or higher, it was categorised as high. See [Table 1](#). This was done for both themes, teamwork and sustainable quality culture and for each respondent group.

The authors also analysed differences in the answers for each statement about teamwork, and for each factors and dimension about sustainable quality culture. This was done for each

respondent group. Statements, factors and dimensions with a standard deviation value above 1.0 were included for further analyse. The differences of answers for a statement are interesting to discuss as it can give insights into differences in respondents' views. All statements with values that were categorised as low or high agreement and with differences above 1.0 were further analysed.

- (3) *Missing values* – The authors also analysed missing values for all statements, factors and dimensions for each theme and respondent group, to identify statements with missing values.

3.5 Analysis of qualitative data

The recorded focus group discussions were transcribed using Microsoft Word. After the transcriptions, each text file was compared to the corresponding audio file. Some adjustments were made by the authors in the text file when the transcribed text did not match the audio file.

The results from the two focus group discussions were analysed by the authors soon after the interviews were conducted. The transcribed texts from the focus groups were coded and analysed using deductive content analysis and by theme. The analytical framework were the eleven prerequisites for real teamwork mentioned in section 2.1 and the nine factors and six dimensions for sustainable quality culture mentioned in section 3.2. The qualitative analysis was conducted in two steps:

- (1) *Positive, negative and differences*—First, the transcribed text was read through by each author. Each author then searched for passages of text in which the respondents talked positively or negatively about their capacity to work as a team or about sustainable quality culture. The authors also searched for text in which the respondents did not seem to have a consensus of opinion. Positive and negative responses and differences in opinions were coded in the text for each theme and respondent group by each author and sorted into the prerequisites and factors.
- (2) *Comparing qualitative analyses* – After conducting step 1, the authors met to compare their analyses. If there were differences in categorisation to prerequisites or factors, these were discussed by the authors until they reached a consensus.

3.6 Merging quantitative and qualitative results for each theme

In the next step in the research design, the authors merged the results from the analysis of the questionnaire with the results from the analysis of the focus group discussion. This was done by presenting the results side by side for each TMT (see Tables 2 and 3). Answers according to the focus group questions: “What are the success factors for creating a sustainable quality culture?”, “How can you work together in the TMT to achieve these success factors?” and “What is important in your management team?” were also summarised in Table 4.

Mean values	Assessed category
1–3.99	Low agreement
4–5.99	
6–7	High agreement

Source(s): Table by authors

Table 1.
Categorisation of statements, factors and dimensions

Table 2.
A joint display
presenting results from
the two tests according
to the theme: teamwork

Test group 1 Theme: Teamwork Quantitative data	Qualitative data (quotes)	Test group 2 Quantitative data	Qualitative data (quotes)
<p>All statements had a mean of 6 or more, except for the statement concerning Leadership varies (4.71)</p> <p>Statements with a difference over 1.0 (std. d) were related to</p> <ul style="list-style-type: none"> Membership is based on competence, not on position in (1.07) Leadership varies (2.14) <p>Missing values (missing answers) related to</p> <ul style="list-style-type: none"> Long-term goals Dependent on each other 	<p>"We are dynamic as a group"</p> <p>"We listen to everyone's views. We often have quite well prepared or very well prepared information"</p> <p>"We have a very high consensus in our decision-making"</p> <p>"The first thing we did when we started the group was to draw up internal rules. What is our mission? How should we relate to each other?"</p> <p>"We have our specific areas. We have the areas where we are more expert in and we have sort of defined our role descriptions . . . that these are our focuses"</p> <p>"We convey good quality of services. I would say . . . and we try to do it cost-effectively and smart"</p>	<p>12 statements of 18 had a mean of 6 or more</p> <p>5 statements had a mean of 5–5.99. These statements concerned</p> <ul style="list-style-type: none"> Long-term goals (5.86) Membership based on competence (5.83) Trust (5.0) Show appreciation (5.57) Listen to each other (5.43) <p>One statement had a lower mean</p> <ul style="list-style-type: none"> Leadership varies (3.43) <p>Statements with a difference over 1.0 (std. d) were related to</p> <ul style="list-style-type: none"> Long-term goals (1.21) Leadership varies (2.23) Show appreciation (1.51) Listen to each other (1.72) Act on decisions taken together, even if not in consensus (1.13) <p>Missing values (missing answers) related to</p> <ul style="list-style-type: none"> Membership based on competence <p>7 members, (6 women, 1 man), age between 31 and 60 years, tenure <5–10 years, 1–9 years as a member of the TMT</p>	<p>"We work a lot with communication"</p> <p>"The safety of the management team, safety and trust"</p> <p>"You are a member of the TMT to work with the whole, and achieve the overall goals"</p> <p>"We follow a number of different metrics . . . we constantly evaluate, I would say"</p> <p>"Then I think we cooperate in a very good way and are trying to bring all the different skills in . . . thus everything can always be better. I think that there is potential for development for certain areas"</p> <p>"We constantly try to adapt our way of working based on what the business needs at the time and who should be in the TMT"</p>
<p>7 members, (5 women, 2 men), even distribution of the age structure (between 30 and 60), tenure <5–20 years, <1–2 years as a member of the TMT</p> <p>"We work a lot as a team, but we need to improve it . . ."</p> <p>"It's a challenge sometimes for a TMT to be a team"</p> <p>"Working in a team means removing this hierarchy a little and seeing how we can cooperate. Different skills are woven together, which leads us to being able to get the best possible results instead of looking at the hierarchy"</p>	<p>"I think this TMT is a very clear team"</p> <p>"It's not like we sit on each other's lap and do everything together all the time, but that doesn't mean to me that we wouldn't be a team"</p> <p>"It's a team that works for the good of the company"</p>		

Note(s): Results from the questionnaire is presented side-by-side with qualitative results from the focus groups

Source(s): Table by authors

Test group 1 Theme: Sustainable quality culture Qualitative data	Qualitative data (quotes)	Quantitative data	Qualitative data (quotes)
4 of 11 factors had a mean of 6 or more. They concerned: - Integrity (Develop committed leadership) (6.29) - Improve continuously (6.48) - Base decisions on facts (6.29) - Pride (6.62)	"Well-founded information is needed to be able to make the right decisions in different situations." "We are a group that takes creative responsibility." "We have a new method for systematic improvement work. "We make adjustments based on results." "The head of administration delegates a lot" "Ensuring that we deliver good quality to our customers, but also to have a good working environment for our employees." "We have a constant dialogue with our customers. What do our customers need and what can we improve?" "This method is used for both overall processes as well as area-specific processes. Both operationally and strategically. For the whole organisation"	9 of 11 factors had a mean of 6 or more 2 of 11 factors had a mean of 5-5.99. They concerned: - Development (Let everyone take an active part) (5.89) - Influence (Let everyone take an active part) (5.90) - Factors with a difference over 1.0 (std. d) were related to: - Development (Let everyone take an active part) (1.17) - Being informed (Let everyone take an active part) (1.11) - No missing values	"We are good at basing decisions on facts." "We develop and adapt the TMT's way of working, and test runs material that will be distributed to the organisation, and everyone in the TMT contributes" "How do we need to work right now?" "We are questioning the existing work processes" "Measurable goals are linked to quality and we follow up and evaluate constantly." "Feedback from the organisation is shared in the TMT" "We follow up and make feedback from customers visible. And we also check the work environment aspect" "We create an understanding of the fact that how and what I do affects others. Connects what is done to the goals. "so we run on the right balls" "An open mind is important to be able to re-evaluate things, and not get stuck in old rules"
7 of 11 factors had a mean of 5-5.99. They concerned: - Empathy (Develop committed leadership) (6.83) - Presence and communication (Develop committed leadership) (5.95) - Development (Let everyone take an active part) (5.56) - Influence (Let everyone take an active part) (5.88) - Being informed (Let everyone take an active part) (6.95) - Customer focus (5.90) - Sustainability and long-term thinking (5.90)			
Factors with a difference over 1.0 were related to: - Development (Let everyone take an active part) (1.40) - Influence (Let everyone take an active part) (1.14)			
Missing values (missing answer) related to: - Influence (Let everyone take an active part) - Development (Let everyone take an active part) - Sustainability and long-term thinking			
Overall comments for sustainable quality culture	"Structure, culture and systematics" "Behaviour connects to the culture. We have started to talk more about behaviours"		"There must always be a why, for doing things" "The culture is something that the TMT creates and that is important. It trickles down throughout the organisation, so it should not be something that gets locked into the TMT. It is really this culture that should affect everyone in the organisation"

Note (6): Results from the questionnaire is presented side-by-side with qualitative results from the focus groups
Source(6): Table by authors

Table 3.
A joint display presenting results from the two tests according to the theme: sustainable quality culture

Table 4.

Success factors for creating a sustainable quality culture from focus groups and suggestions for improvements presented at the follow-up meetings

Test group 1	Test group 2
<p><i>Success factors for TMTs working as a real team to create a sustainable quality culture (from focus groups)</i> Structure, culture, systematics, good communication, flexibility, lack of prestige, talking about behaviour, change has to take time, capacity to act together and produce well-founded data for making decisions</p> <p><i>Suggestions from the researchers for improving teamwork and sustainable quality culture (presented at the follow-up meetings)</i></p> <ul style="list-style-type: none"> - Clarify the purpose and goals for the TMT - Clarify the meaning of leadership - Clarify work methods and behaviours in the TMT - Clarify how different competencies and roles can complement each other - Work with strengthen and define the various core values that form the prerequisites for creating a sustainable quality culture, for example everyone's participation - Work with strengthen sustainability and system perspectives as well as long-term thinking in both the TMT and in the organisation 	<p>Structure, transparency, important with clear and measurable goals connected to quality, commitment and loyalty, communication, continuity, evaluate and doing things better</p> <p><i>Suggestions from the researchers for improving teamwork and sustainable quality culture (presented at the follow-up meetings)</i></p> <ul style="list-style-type: none"> - Teamwork—shows a unified picture of clear structure and systematics but a more differentiated picture of the more “soft” values. What could this be due to? - Work with strengthen and define the various core values that form the prerequisites for creating a sustainable quality culture, for example everyone's participation - Clarify the purpose and goals for the TMT - Clarify the meaning of leadership - Clarify, work methods and behaviours in the TMT - Clarify how different competencies and roles can complement each other - Work with communication

Source(s): Table by authors

3.7 Interpreting results for each theme

The merged results for each TMT were then interpreted, and similarities and differences for each theme and TMT were discussed by the authors.

From this interpretation, the authors agreed on proposals for each TMT with regard to how that specific TMT could improve its capacity for real teamwork and sustainable quality culture in their organisation. See [Table 4](#).

3.8 Meta-interpretation of the results – both themes

To deepen the knowledge about how real teamwork within TMTs relates to sustainable quality culture, both themes for each TMT were compared side by side in a meta-interpretation. The authors looked for similarities and differences by theme according to the previously presented results (see [Tables 2 and 3](#) together).

3.9 Follow-up meeting

The last step in the research design was a follow-up meeting with each TMT to present and discuss the results from the different analyses and to suggest improvements (see [Table 4](#)). The purpose of these meetings was also to verify the results with each TMT. These meetings were held in the beginning of June 2022.

4. Findings

Findings are divided into two parts: results from the tests and a description of the developed methodology.

4.1 Results from testing the methodology with two TMTs

The results from the two tests are presented in Tables 2–4.

4.2 The developed methodology

The methodology to assess teamwork and sustainable quality culture, focusing on TMTs, was documented based on the previously described research design and is containing of five steps (see Figure 2).

Step 1 – Introduce participants

The first step is to introduce participants. This includes describing the purpose, practical process, types of data collection methods, analysis, follow-up meeting and ethical aspects of research.

Step 2 – Conduct questionnaire and focus group discussions

The next step is to send out an electronic questionnaire about teams, teamwork and sustainable quality culture to the participants in a selected TMT. A focus group discussion, following the interview guide, will then be conducted with the same participants that have answered the questionnaire.

Step 3 – Analyse quantitative and qualitative data

The third step involves analysing data from the questionnaire and the focus group separately, following the steps described earlier (See 3.4 and 3.5).

Step 4 – Merge and interpret results

The results from the analysis are then merged into a table, following the steps described earlier (See 3.6, 3.7 and 3.8).

Step 5 – Follow-up meeting and evaluation

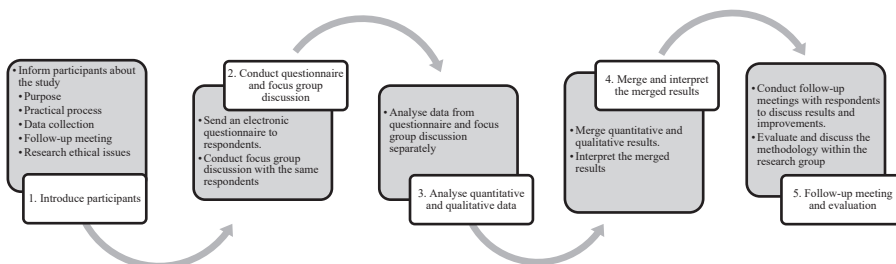
After merging and interpreting the results, a follow-up meeting is held with the participants together. The purpose of the meeting is to discuss the results and propose suggestions for improvements to increase the capacity to real teamwork and with sustainable quality culture.

This step also includes to evaluate and discuss the performed methodology. The purpose of this evaluation is to improve the methodology.

5. Discussion, implications and further research

5.1 Results discussion

Previous research confirms that working in teams is often more successful than working individually for reaching common goals (e.g. Richardson, 2011; Kozłowski and Ilgen, 2006).



Source(s): Figure by authors

Figure 2. Five steps in the developed methodology for assessing teamwork and sustainable quality culture, focusing on TMTs

A TMT, as the highest level of leadership in an organisation, typically contains of leaders from different parts of the organisation with their own goals, which can make it challenging to operate as a team, and even more as a real team. However, there is a desire for leaders, especially the TMT of an organisation, to be role models for the organisation, both when leading and when creating a sustainable quality culture. For example, [Petty et al. \(1995\)](#) conclude that an organisational culture that emphasises teamwork is more advantageous to organisational effectiveness. The TMT is a key resource for an organisation's sustainability ([Xu et al., 2019](#)). Therefore, can teamwork within the TMT contribute to performance in creating a sustainable quality culture in their organisation.

The purpose of this study was to present a developed, tested and evaluated methodology that assessed teamwork and sustainable quality culture, focusing on TMTs. Findings from developing, testing and evaluating this methodology showed that it can be used to assess teamwork and sustainable quality culture. The five steps in the methodology provide a structure for assessing and evaluating teamwork and sustainable quality culture, focusing on TMTs. The results also showed the strengths of using two data collection methods, providing a broader picture of, if and how teamwork and a sustainable quality culture exist in an organisation.

The results from the two tests are presented side-by-side in [Tables 2–3](#). This makes it easier to get a holistic view of the results. The quotes from the focus groups discussions are reflections of the perceived teamwork and the sustainable quality culture and are complementing and deepening the quantitative results. The two tables make it possible to view the two themes together and to reflect over results jointly. Two interesting quotes adapting to the assumption of that real teamwork in the TMT promotes a system view and that the TMT has an important role in creating a sustainable quality culture in the organisation were: “Working in a team means removing this hierarchy a little and seeing how we can cooperate. Different skills are woven together, which leads us to being able to get the best possible results instead of looking at the hierarchy.” and “The culture is something that the TMT creates and that is important. It trickles down throughout the organisation, so it should not be something that gets locked into the TMT. It is really this culture that should affect everyone in the organisation.”

The follow-up meetings with the two TMTs were an opportunity to validate the results and also provided additional value to the two TMTs, such as suggestions on how to improve teamwork and sustainable quality culture. The follow-up meeting was also a form of reflection for the TMT, shedding light on strengths and weaknesses with regard to teamwork and sustainable quality culture. Therefore, this type of meeting can be an important aspect of ongoing work to improve teamwork and sustainable quality culture.

[Edmondson \(2013\)](#) states that teamwork should be viewed as a process and not as a single activity or a construction. It is about acting, not just formulating goals and designing working processes. It is about creating value for our customers and society. This might be more important now than ever, as today's changing world requires a shift in how teams operate. This may also mean that members of teams need to have different skills today than in the past to adapt to a changing environment. Speaking up, collaborating, experimenting and reflecting are four pillars that, according to [Edmondson \(2013\)](#), are important for effective teaming and for the future. Working structurally and with a system perspective on teaming for quality alongside a sustainable quality culture can create prerequisites for sustainable organisational performance. This new methodology offers one approach.

5.2 Methodological discussion

The methodological discussion will focus on the chosen research design and data collection methods. A convergent mixed method design was chosen to better understand the

phenomena of study, namely teamwork and sustainable quality culture. A convergent design can be efficient in that it includes both quantitative and qualitative data collection in one phase of research and roughly at the same time (Creswell and Plano Clark, 2017). However, there are also negative aspects to this design, for example issues with different sample sizes and challenges merging text and numerical data and when explaining contradictions in results of quantitative and qualitative data (Creswell and Plano Clark, 2017).

Questionnaires and focus group discussions were chosen as complementary data collection methods in this convergent design. A questionnaire provides numerical data, offering a brief view of respondents' perceptions. Focus group discussions provide a deeper understanding of a phenomenon (Creswell and Plano Clark, 2017). Focus groups also give participants an opportunity to explore each other's opinions and discuss them together, which can also contribute to new insights (Bryman, 2016). As the authors wanted the members of the TMTs to reflect on working processes and quality culture together, focus group discussions seemed to be a preferable data collection method to individual interviews. However, there are also negative aspects of focus groups. One reflection that occurred during the focus group discussion was that the results from the questionnaire and focus group differed depending on how secure the team members of the TMT felt about giving their opinions during the interview and the approach of the CEO. In one of the TMTs the CEO took a more anonymous approach and let the other team members talk freely. In the other TMT, the CEO spoke most of the time and questioned other members who did not agree on what was said. Thus, having complementing data collection methods can strengthen the results, make them more reliable and highlight results that otherwise would not have been revealed.

5.3 Implications and further research

This is the first of two papers. In the second paper, this developed methodology for assessing teamwork in TMTs and sustainable quality culture will be applied and analysed for multiple cases.

The evaluation of the developed and tested methodology raised thoughts about how to further develop the methodology. To gain further understanding of how TMTs can improve their teamwork capacity, alongside sustainable quality culture, the authors propose to add sustainable organisational performance to the presented methodology. According to Pantelic *et al.* (2016), the core value of sustainability is embedded in the long-term maintenance of quality of life and can be seen through environmental, economic and social perspectives. Measuring organisational success through these perspectives can be done using different key performance indicators, often derived from an organisation's strategic and environmental objectives. Previous research supports the influence of sustainable quality culture on performance (e.g. Valmohammadi and Roshanzamir, 2015; Abdullahi Hassan and Haim, 2016) and the argument that an organisational culture variable has been one of the principal components in clarifying organisational results and achieving organisational excellence (e.g. Gambi *et al.*, 2015; Schein, 1984). However, an important issue for future research will be to understand the complexities of the relationship between organisational culture and corporate sustainability (Linnenluecke and Griffiths, 2010). Thus, sustainable organisational performance seems to be an issue for further exploration and an additional perspective to this new methodology.

The questionnaire was only answered by members of the TMT. This means that only their perceptions of sustainable quality culture within the organisation were assessed. To widen the perspective, the part of the questionnaire about sustainable quality culture could also be answered by co-workers. This could reveal differences between the TMT and the co-workers in their perceptions of sustainable quality culture within the

organisation. Such results will be a base for how to improve, both teamwork in the TMT alongside with sustainable quality culture and give new insights on leaders' and co-workers' perceptions on that matter.

Another interesting area for further research is the dynamic between teamwork within TMTs, sustainable quality culture and sustainable organisational performance in relation to changing environmental needs and requirements. Further research could also be to use the method over a longer period of time to see how teamwork in the TMT develops and how sustainable quality culture changes.

Note

1. Focus on customers, base decisions on facts, improve continuously, let everyone take an active part, develop committed leadership, long-term and sustainable thinking, pride, internal system view and external system view.

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Appendix 1 Questionnaire

Questionnaire – Statements Part I – Teamwork in our top management team (TMT)

- (1) We have an explicit purpose for our TMT's internal work.
- (2) We have long-term goals that apply to our TMT's internal work.
- (3) We have stated internal rules for how to act and work in our TMT.
- (4) We depend on each other's work efforts to achieve the TMT's goals.
- (5) We know each other's competencies and how we all contribute to achieving the goals of our TMT and the organisation.
- (6) Membership of our TMT is based on competence, not position, in the organisation.
- (7) We are mutually responsible for the performance of our TMT.
- (8) Leadership in our TMT varies depending on whose skills are important at the time.
- (9) We regularly reflect on how we can improve our working methods in our TMT.
- (10) We regularly reflect on how we manage to achieve our TMT's goals.
- (11) We trust each other in our TMT.
- (12) We have fun together in our TMT.
- (13) We show each other appreciation for what we do in our TMT.
- (14) Everyone in our TMT is involved and committed to what we do.
- (15) We always listen to each other in our TMT.

TQM
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- (16) We show each other respect in our TMT.
- (17) We always act on the basis of the decisions we have made together even if they are not taken in consensus.
- (18) I look forward to attending our TMT meetings.

170

Questionnaire – Statements Part II – Sustainable quality culture

- (1) We work together with our customers to develop our business.
- (2) I see my employees and give them support.
- (3) My commitment is visible and active.
- (4) I keep my promises.
- (5) Our employees are given good opportunities for personal development.
- (6) Our employees can influence their work situation.
- (7) Communication in the organisation works well.
- (8) We are constantly working to become a little better at everything we do.
- (9) We base our long-term decisions on facts.
- (10) We have a common vision for the whole organisation that extends over several years.
- (11) I am proud of my workplace.
- (12) I know how my efforts contribute to the organisation's overall goals.
- (13) We work with our suppliers to create value for our customers.
- (14) We know what creates value for our customers.
- (15) I understand my employees' work situation.
- (16) I communicate with my employees in a good and clear way.
- (17) I act in an exemplary manner and lead by example.
- (18) Our employees are given sufficient opportunities to develop their skills.
- (19) Our employees can adjust their working hours if necessary.
- (20) Our employees receive sufficient information.
- (21) We have time to work on improvements in our everyday lives.
- (22) We believe it is important that decisions are fact based to create sustainable quality in what we do.
- (23) We include economic, social and environmental aspects when making decisions on development and improvements.
- (24) I am proud of my work effort.
- (25) I know how my work is connected to other parts of the organisation.
- (26) We see our organisation as part of a larger whole.
- (27) We know what our customers' needs are.
- (28) I recognize my co-workers when they have done a good job.
- (29) My co-workers are not afraid to speak their minds.

- (30) I treat everyone equally.
- (31) We use our performance appraisals as a tool to create participation.
- (32) Our employees' suggestions for improvement are taken seriously.
- (33) Dissemination of information in the organisation works well.
- (34) We focus on the thing and not the person, if something goes wrong.
- (35) When we prioritize between activities, we do so with the help of fact-based data.
- (36) We always plan our resources over several years.
- (37) I am proud of our management team's work.
- (38) We make decisions based on long-term thinking, even if it comes at the expense of short-term financial goals.
- (39) I know what the overall goals of the organisation are.

Appendix 2

Interview guide – Top management teams (TMTs)

1. Introduction

- Researchers' backgrounds

1.1 Ethical principles

- Consent requirement
- Information requirement
- Aim and description of the study
- Voluntary participation and the right to cancel at any time without giving a reason
- Confidentiality requirement
- Utilisation requirement

2. The focus group interview

Tell us briefly about yourself

- What role do you have in the TMT and in the organisation?

2.1 Teamwork

What do *team* and *teamwork* mean to you?

- What is a team? What is not a team?
- What is important to a team?
- Is your TMT a team? Why/why not?
- How should you work in a team to succeed?
- Does your TMT need to be a team?

What is the purpose of your TMT?

How would you describe the leadership in your TMT?

- Does the leadership vary depending on which skills are important at the time?

How does your TMT work to create prerequisites for the organisation?

- Sustainability
- Using long-term thinking

Are you successful in your work in the TMT?

- How do you know if you are doing a good job?
- Are co-workers given good opportunities for personal development?

Do you feel proud of your work in your TMT?

What is most important to you in your TMT?

2.2 Sustainable quality culture

What is (for you) quality culture?

- What does quality culture mean to you?
- What does it cover?
- What things are important for a good quality culture?

What is sustainable quality culture?

- How can it be sustainable?
- How do you work to create a sustainable quality culture?
- How do you work to strengthen the quality culture in the organisation? Give an example of when you have succeeded in strengthening the quality culture in the organisation.

What are the success factors for creating a sustainable quality culture?

- How can you work together in the TMT to achieve these success factors?
- What is important in your management team? (team, respect, trust).

3. Reflections on the focus group and the questionnaire.

How did you find the interview questions and statements of the questionnaire?

Is there anything you would like to add?

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