A Study of the Agile Coach's Role

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Abstract. While Agile Software Development has recently received much attention in industry, the implementation of agile methods and practices is not straightforward, partly because the approach focuses on people and their interactions. To facilitate the adoption of agile methods and the further development of agile teams, the role of an agile coach has been introduced. However, this role has not been sufficiently explored from the perspective of those whose perform that role. To address this gap, we conducted a case study where we interviewed agile coaches with experiences from multiple companies. We identified the main objectives of agile coaches, the methods they use to achieve those objectives, the challenges they frequently face, the skills required by the role, and the value they provide to organizations and teams. Our findings contribute to a better understanding of the role and the construction of a professional identity. In addition, we offer a characterization that can be useful for professionals that are new in the role.

Keywords: Agile Software Development, Agile Coach, Agile Adoption

1 Introduction

Many organizations have either adopted agile software development methods or are in the process of doing so. Those who have implemented an agile approach, follow a specific method such as Scrum [1] or Kanban [2] while others combine different methods [3]. Meanwhile, some companies are actively working to replace traditional plan-driven methods, such as Waterfall, with agile methods.

Maintaining effective teams or transitioning to Agile is not straightforward. One reason is that agile methods are human-centric, i.e., people and their interactions, both within teams and with customers, take precedence over rigid processes, tools, and contract negotiations [4]. Thus, building functional teams, improving team performance, and aiding companies to implement agile methods, require adopting and developing an agile mindset [5]. Agile coaches aid organizations and teams in such activities.

The main role of an agile coach is to facilitate team discussions in pursuit of improved team performance [6]. In executing this role, agile coaches have the responsibilities of facilitation, problem-solving, coaching, teaching, and mentoring [1, 6–8]. Agile coaches also help teams to identify how they can improve their work to achieve

better performance [9]. Furthermore, agile coaches also aid companies who are transitioning into employing agile methods [10]. Agile coaches, therefore, contribute with a better understanding of agile methods and practices [11], enhance teamwork [12], raise productivity [13], improve product quality and reduce cost [14], create better solutions, and contribute to successful projects conclusions [15].

Despite the importance of agile coaches [16], little research has been conducted about this role. Most studies focus on exploring the role of agile coaches from the perspective of scrum masters. For instance, Adkins [6] compare the role of an agile coach to that of scrum masters and project managers. Noll et al. [17] conducted a systematic literature review and a case study to identify the role of scrum master and its intersection with other roles, such as project manager. However, agile coaches are not confined to Scrum only. Rather, they can aid companies following other agile methods and those transitioning from sequential plan-driven methods to agile methodologies. Furthermore, several studies [11, 15, 18] have explored the role and function of agile coaches from a company perspective. For instance, how agile coaching is structured at British Telecom [11] or how agile coaching is conducted at Spotify [18]. Thus, existing work focuses on agile coaching as a variant of scrum master or from an organizational perspective, but not from the perspective of those who are performing the role, i.e., agile coaches. We seek to address this gap.

This paper aims to explore different aspects of the agile coach role from the perspective of those who work as agile coaches. We explore what the objectives of agile coaches are, the methods they use, the challenges they face, the skills required, and finally, the value they add. In our attempt to explore these topics, we use the case study research method where we conduct in-depth interviews with agile coaches [37]. Our study contributes to the field of Agile Software Development by adding to the existing knowledge empirical data that leads to a better understanding of the role and the construction of a professional identity. Thus, our contribution is particularly relevant for agile coaches and organizations considering enlisting the help of agile coaches.

The remainder of the paper is structured as follows. In the next section, we present the background related to the agile coach role. Next, in Section 3, we present our research method. Following that, in Section 4, we present our results. Section 5 discusses our results. Section 6 summarizes the limitations, and Section 7 concludes the paper.

2   Related Work

The study of the role of the agile coach involves two fundamental concepts that must be clarified, *role* and *coach*. A *role* can be understood as an institutionalized behavior pattern, defined in terms of their rights and obligations [19]. In this regard, the IEEE Professional & Educational Activities Board (PEAB)[1] propose a model of IT professional role. This model includes the definition of the job role as a type of position in an organization that is characterized by the responsibilities for the performance of

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[1] PEAB Web site – https://www.computer.org/volunteering/boards-and-committees/professional-educational-activities

activities assigned to a position. The board also recommends that job roles should be clearly defined in terms of responsibilities and the competencies required.

On the other hand, the concept of *coach* has been originally linked to instruction and training, where *coaching* referred to a process used to transport people from where they are to where they want to be. The development of *coaching* has been influenced by many fields, such as in education, sports, leadership studies, and various subfields of psychology [20, 21]. In the context of Agile Software Development, the concept of *coaching* has been applied to *agile coach*.

Several authors have aimed to discuss the role of agile coaches. For example, agile coaches have been related to well-defined roles, such as the scrum master. According to Adkins [6], an agile coach is "a scrum master who takes teams beyond getting agile practices up and running into their deliberate and joyful pursuit of high performance". Adkins understands agile coach as a role different from that of the scrum master, but the author also remarks that some responsibilities can overlap depending on the goals.

According to the Scrum Guide [1], a scrum master is mainly responsible for helping the scrum team in removing impediments and maximizing the value the team creates. The responsibilities include the achievement of the goals, determining the scope, the team's understanding of the product domain, and finding techniques to manage the product backlog in the most effective way. Interestingly, the scrum guide also indicates that scrum masters should *coach* the team in self-organization and cross-functionality, which points to the fact that both, scrum masters and agile coaches, have coaching responsibilities in common [1, 6].

A practitioner playing a scrum master's role can also play other roles at the same time. In fact, Noll et al. [17] found that the scrum master performs several activities in addition to the traditional ones, such as process facilitation, ceremony facilitation, and impediment removal. Among these additional activities, project management is commonly performed by scrum masters, which leads to a conflict of interest that can compromise the balance between the interests of external stakeholders and the scrum team.

To better understand the job of an agile coach, several authors have described the responsibilities that the role involves. For example, Santos et al. [22] point out that an agile coach has to facilitate the team to consider different alternatives on how to improve their processes, help the team to see what to do next, and also guide them on how to take responsibility for their doings. Similarly, Adkins [6] describe the agile coach as a teacher, facilitator, coach-mentor, conflict navigator, collaboration conductor, and problem solver whose main goal is to help the team to adopt and improve their use of agile methodologies.

O'Connor and Duchonova [10] contextualized the agile coach's role depending on the stage of adoption of agile methods, that is, if the teams are in the process of adopting agile methods or are already working with agile practices. In both cases, teams need help to either resolve an issue or to improve efficiency, and the agile coach can introduce benefits to companies that exceed the financial costs of using an agile coach. It is also possible to distinguish between external agile coaches (temporarily hired as consultants) and in-house coaches, and sometimes a combination of them [15]. Another way to differentiate the coaches is according to whether they use a directive or non-directive approach. In the directive approach, the coach is an expert whereas the goal

of his work is to help the team to learn and solve not just a specific problem in hands but also problems in future [23].

Althoff [24] describes the role of the agile coach as the composition of other roles such as a planner, motivator, reflector, and process supervisor. The Agile Coaching Institute[2] suggests eight competencies that are needed for performing the agile coach role: Professional Coaching, Facilitating, Domain Mastery (Transformation Mastery, Business Mastery, Technical Mastery), Mentoring, Teaching and Agile-Lean Practitioner [7]. Table 1 summarizes the roles and the activities that have been related to the role of agile coach.

Table 1. Summary of the roles and activities performed by agile coaches.

Roles and Activities	Adkins [6]	Scrum Guide [1]	Bass [8]	Noll et al. [17]	Althoff [24]	Spayd and Adkins [7]
Facilitator	X	X	X	X		X
Problem solver	X	X	X	X		
Coach	X	X			X	X
Teacher	X	X				X
Mentor	X		X			X
Leader		X	X			X
Process anchor			X	X	X	
Collaboration conductor	X	X				
Change management agent		X				X
Sprint planner			X	X		
Integration Anchor			X	X		
Conflict Navigator	X					
Sprint reviewer				X		
Planner					X	
Motivator					X	
Life coach	X					
Agile-Lean practitioner	X					
Prioritization				X		
Estimation				X		
Travelling				X		
Project management				X		

3   Method

The case study research method employs qualitative methods to investigate a particular reality within its real-life context [25], in particular when the boundaries distinguishing the object of study and its context are not clear [26]. Case studies can be used for confirming a hypothesis [25, 27], evaluate a method [28], and for exploratory purposes [25, 27]. For our research, the case study method is suitable as it enables an in-depth

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[2] Agile Coach Institute Website – https://www.agilecoachinginstitute.com

exploration of the role of agile coaches in its real-life setting. Yin [26] argues for the necessity of defining a research question when designing a case study. We use the case study method to explore the following research questions:

RQ1 - What are the objectives of an agile coach?

RQ2 - What methods do agile coaches use to achieve their objectives?

RQ3 - What challenges do agile coaches encounter in their work?

RQ4 - What skills do agile coaches require and use?

RQ5 - What value do agile coaches perceive themselves to add?

These research questions are relevant given that the agile coach role is relatively new, little research has been conducted so far, and, thus, there is a need to empirically explore this role further.

3.1   Case Study Design and Execution

The design of our case study is shown in Figure 1. It consists of three main steps, i.e., preparation (first step), data collection (second step), and analyzing the collected data (third step). In the following, we describe the steps in more detail.

The first step of the case study was preparation. As part of the preparation, we identified the method to gather data, prepared for the data collection, and defined and selected sources for data collection. We used interviews for data collection. According to Merriam [29], the interview method is particularly suitable for eliciting information about something that is difficult to observe. We employed semi-structured interviews with open-ended questions. We used open-ended questions as they provide more in-depth responses than closed questions. The interview questions were derived from our research questions. The questions focused on the personal experience of the participants as agile coaches in general rather than on the specific experience in one company. The interview questions are available as supplementary material.

As interviewees, we sought people who actively work as agile coaches. In order to identify candidates, we approached a network created and run by professional agile coaches in northern Europe. Before selecting, we ensured that they had working experience as agile coaches and were willing to be interviewed. The interviewees varied in their working experience as agile coaches and/or scrum masters (years of experience), experience with multiple companies (concurrent engagements), and number of teams they concurrently work with on average (concurrent reams) as can be seen in Table 2. In total, we selected eight interviewees. All interviewees insisted on full anonymity; thus, we do not disclose full demographical information.
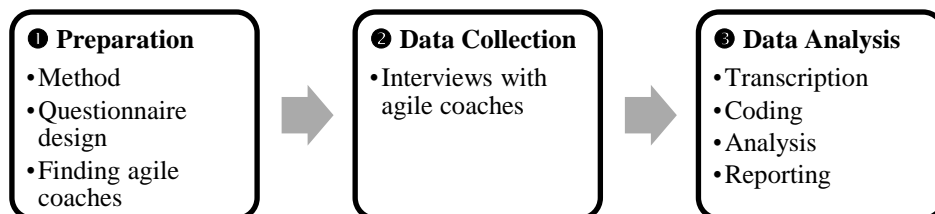

Fig. 1. The design of our case study.

Table 2. Characteristics of the interviewees who participated in the study.

Participant	Experience (years)	Multiple Engagements*	Teams*
P1	>5	Yes	1
P2	>5	Yes	1
P3	2-5	Yes	>5
P4	<2	No	2-5
P5	<2	No	2-5
P6	>5	Yes	1
P7	>5	No	2-5
P8	2-5	Yes	2-5

(*) Concurrent

In the second step of our case study, we collected data by conducting interviews. The interviews were conducted face-to-face and online by the first author. The interviews were recorded, either by using the online tool used or with a voice recorder. The average length of the interviews was about one hour. Initially, 6 interviews were planned. Having conducted these interviews, we noted data saturations i.e., no new information is being provided by additional interviews. We, however, sought and conducted two more interviews to ensure we had enough interviews [30].

In the third step, we analyzed the collected data. All interviews were transcribed and encoded. The coding process was conducted according to the guidelines proposed by Braun and Clarke [31], i.e., familiarizing with data, generating and searching for initial themes, reviewing themes, and finally, defining and naming themes. Therefore, we first familiarized ourselves with the data by compiling all the transcripts into one document. Then we carefully read them and added notes. Next, we generated a set of initial themes. The themes corresponded to a research question. Each theme was further refined into codes, each of which relates to a specific aspect of the theme (research question). For instance, the theme named *Objectives* correspond to the first research question. Within this theme, we identified four codes, *Educating*, *Aiding*, *Creating Spaces*, and *Improvements*. Following this, the second and third authors reviewed the themes and codes through discussion. The final set of themes and codes, together with their frequency, are listed in Table 3.

Table 3. Finalized themes and sub-themes of the analysis.

Theme	Codes	Frequency
Objectives	Educating	7
	Aiding	6
	Creating Spaces	4
	Improvements	2
Methods	Coaching	10
	Teaching/Mentoring	7
	Observation	5
	Facilitation	5
	Calming down	1
Challenges	Preserving Authority	6
	Problem Understanding	6
	Mindset	3
	Aligning Plans	1
	Team Changes	1
Skills	Agile Knowledge	15
	People Skills	12
	Coaching	4
	Teaching Skills	3
	Facilitation Skills	3
Value	Development of Teams	7
	Influence	6
	Contextual	4
	Knowhow	2
	Measures	2

4   Results

In this section, we present the results of our case study following the order of our research questions. We first present the results regarding the objectives of agile coaches (RQ 1). Then, we examine what methods they use (RQ 2) and what challenges they encounter in their work to achieve the objectives (RQ 3). Next, we investigate what skills are required and used by agile coaches (RQ 4) and, finally, we probe what value agile coaches perceive they provide (RQ 5).

4.1   The Objectives of Agile Coaches

The first research question refers to the objectives of agile coaches. The results presented are from the perspective of those interviewed. We noted that the role of an agile coach is difficult to define. As one participant noted, "*this is a very big role*" and, as another stated, "*Agile coach is more like this umbrella term*". Thus, the practitioners found it challenging to define their role. We, therefore, approach the role of an agile coach by exploring the objectives of an agile coach. Objectives, in this context, refer to

what companies expect agile coaches to achieve. The objectives identified relate to training teams, aid teams in performing better, create and maintain spaces for knowledge sharing and discussions, identifying improvement opportunities, and helping individual team members.

We note that the most often mentioned objective is that of educating different stakeholders about agile methods. One participant noted that, as agile coaches, they work with "*a portfolio of trainings, which we do for the organization*". The second most common objective relates to aiding teams. Several practitioners explained that their objective is to help teams perform better. For instance, one interviewee noted that their objective is partly to "*help the team to be together, to be in contact with each other, ... to help them to continuously focus on the goals*". Part of this objective is to work with teams to foster better cooperation. One practitioner noted that *"...but also, more like human topics, like cooperation and what are the agreements between team members and how things are done."*

Several practitioners also noted that, as part of their objective, they create and maintain different forms of communities (forums) that enable and foster knowledge sharing and discussions. One practitioner stated that "*I have done these gatherings knowledge exchanges for Scrum Masters and for product owners. ... I will talk about their role, what are their challenges...*". Another objective we noted is that of identifying opportunities for improvement. Spaces dedicated to knowledge sharing and discussions can provide input for identifying improvement opportunities. As one practitioner stated, one of the objectives is that of trying to *"...identify things that we can work together, me and that person, to improve their way of working and for that I use this one on one Coaching."* The scope of agile coaches is not restricted to teams only. Rather, agile coaches work with individual team members when needed. One of the agile coaches noted that they also work with *"solving personal development related problems"*.

4.2   The Methods Used by Agile Coaches

The second research question concerns what agile coaches do, i.e., how they achieve their objectives. Agile coaches adopt a cautious approach when working with teams. To achieve their objectives, agile coaches "*try not to help people, who do not ask for our help. ...If we see that something doesn't work, we are not the unit who will come and say hello guys, you are wrong. This is not our approach. We are helping only those who are willing to get our help. Because only in this case, there will be some results.*" Naturally, the method is, to some extent, dependent on the context. Practitioners might *"choose an approach according to the situation"*. However, some methods were mentioned more frequently.

The most frequently mentioned method was observation. Most interviewees mentioned that the first step is to observe. Agile coaches need to observe the team so to understand the current situation. One practitioner stated that "*...when I'm going to a new team, it starts with observation*". Observation is used throughout the work agile coaches do. It is important for agile coaches to observe, for instance, the daily interactions and problem-solving methods of the teams they coach. Such observations are shared with the team as basis for discussion. For instance, one agile coach expressed

that "*I will discuss my observations with the teams… and see what we are gone do about that*.".

It is worth to note that the COVID-19 pandemic developed at the time when the interviews were being conducted, and the Nordic countries went into lockdown. Therefore, companies changed their modality to the use of remote working. This introduced new challenges for conducting observations. The interviewees stressed the importance of physical presence during the observation and the limitations of online tools. One participant expressed: *"… if I'm used to observe peoples' body language, conversations, then this is lost [now], and of course, it makes it more difficult for me …"*. The coaches also noted differences according to the experience of the teams, and particularly noticeable for new teams: *"When there is one new team, with them it's very hard, we have to create a vision and decide where we want to get with the team. Usually it's like this, that we come together with a team in one room … and will not exit before we have a concept. Today it's very hard to do."*

As expected, the activity of *coaching* was also mentioned. One participant expressed that "*… I try coaching as a discussion between me and the team*". In addition to coaching, mentoring and teaching were mentioned as well. For instance, as one participant stated, "*…we have meetings and we discuss their situations and I talk about what's in the book and what other teams are doing and share the knowledge*." Likewise, agile coaches teach the team about certain aspects of agile methodologies. For instance, shared that it is common to do "*…teaching, e.g. how to write user stories.*"

Facilitation is another method used by agile coaches. As one participant stated, *"I facilitate and put together different kind of workshops that are needed in order to improve the teamwork or the process, because for example there are teams, were roles are quite mixed up".* Facilitation is not restricted to workshops, but also used for different ceremonies and "*the other thing is then retrospectives…".*

Agile coaches interviewed have "*one-on-one talks*" with "*open questions*". At times, when emotions run high, agile coaches employ methods for calming down, such as, "*…breathe deeply and be calm…*"

4.3   The Challenges that Agile Coaches Face

Agile coaches, when working with achieving their objectives, encounter challenges. Here, we explore the third research question of what challenges agile coaches encounter in their work. The most frequent challenge mentioned was about persevering authority. Agile coaches do not have authority to decide and enforce decisions. Often, the agile coach has the right experience and knowledge to know what will work and what will not. However, they work with educating and influencing the teams. As one participant expressed, "*Coaching itself, well mentoring is easy, but those situations, where you are like … you are doing it wrong, I would so much like to tell you that, I have done it for years, this will work. This is the most painful thing*." At the same time, they need to maintain a certain degree of authority so to be taken seriously, listened to, and their advice heeded. Thus, as one of the practitioners said, it is a challenge to "*preserving authority and being friend to the team at the same time*."

Agile coaches need to understand the real problem that is to be solved. This is a challenge. To identify the real problem, both experience and time with the teams are required. Junior agile coaches have not yet accumulated enough experience to confidently identify the real problem. Experienced agile coaches who work with several projects, find it difficult to dedicate enough time to each engagement to identify the real problem. As one agile coach stated, "*there is a lot of running around and talking to people. ... I can say that, when working with many teams simultaneously, the Coaching quality or teaching quality ... drops, compared to the case when I would have the time to focus and physically be near to this one team, see their problems and understand how to help*". Meanwhile, the expectations on agile coaches to find the problem and solve it is, at times, high or even unrealistic. As a practitioner expressed it, "*sometimes these expectations to the coach are that, he will come and fixes everything quickly and solves all the problems. But usually the problems are somewhere very deep in the organization, inside the culture of the organization ...*".

Another challenge noted refers to working with the mindset of mangers and team members. As one of the interviewees expressed it, "*... people have previous mentality of waterfall and they are not used to this way of working that is maybe very dynamic for them or too dynamic in their opinion. They are used to think about the problem ... every detail of everything and then start to implement it...*" This challenge is not confined to only mangers, but also team members. In particular, when agile coaches work with guiding and aiding organizations to adopt agile practices. Furthermore, this challenge arises when companies implement an agile method as a plug in. For instance, one agile coach stated that "*many problems that I see, come from that, that people kind of take the model of Scrum, implement it in their organization and then say, it didn't work. ...it assumes, that you actually make structural changes in your company.*"

The interviewees also mentioned that confirming and aligning plans with stakeholders, is challenging. One participant stated that "*aligning with everyone, meaning the team, the key account manager, also POs would actually be happy and it would fit to everyone's plans. This is a challenge.*" Another challenge mentioned was that of dealing with changes, i.e., "*in my experience ... I have not had the luxury of having so stable teams ..., that I shouldn't make any changes, or the team should not make any changes or that there are no new members joining or leaving the team*".

4.4   The Skills of Agile Coaches

Agile coaches, as noted above, perform their role as an "umbrella" when achieving one or several objectives. Thus, it is expected that the skills required by agile coaches varies. Furthermore, agile coaches are different and, thereby, require different skills. One agile coach noted that "*there might be different competencies, some people know more about products and are stronger in product management area. Every agile coach ...have their own handwriting, so quite often we are different and work differently ...*". Nevertheless, we noted that the main skills required are either related to abilities to interact with others and knowledge about agile methods.

The most frequent skill mentioned related to knowledge about agile methods. Several in interviewees stressed that it is important to have knowledge about several agile

methods and frameworks. As one participant said, "*first, there has to be like a strong knowledge of Agile Frameworks, not just Scrum, but preferably others as well ...;*". It is not sufficient to know about the method, but one has to understand the process as well. One practitioner expressed that it is important to grasp "*process management ... kind of like an engineer, but not software engineer, but process engineer ... who understands systems and how they work ...*". Furthermore, another practitioner emphasized, in addition to understanding of agile methods, the importance to believe in agile values: "*...he ... needs to believe in agile values ... he needs to understand why agile is important and how to implement it in a Software company ...*"

Another frequently mentioned skill is "people skills" which was quite expected. As one practitioner expressed it: "*they need to be able to understand people and work with people.*" Closely related to people skills, are coaching, mentoring, facilitation, and teaching skills. For instance, one interviewee said "*Aaa, coaching, obviously...*" while another said, when discussing about skills, that "*… and others are like mentoring, so you mentor… in your teams.*" Given that agile coaches work with teams and train teams, it is also expected that they have facilitation and teaching skills.

Although this knowledge can be gained with experience, it is still necessary to have it as an agile coach. One of the participants explained that: "*... you can also start working as a Scrum Master very young, sort to say after school and I have seen some very good young people, who work as Scrum Masters, but let's say, for one to be good in their job, this is a thing, that comes with time ... it is not possible to learn to job of a Scrum Master so that I attend a course, read two books and start doing it ... yes, you have to know and understand the framework and have to have heard about the mindset, but addition to that comes the dimension of experience.*"

4.5   The Value Delivered by Agile Coaches

The fourth research question concern the value agile coaches deliver, as perceived by themselves. The value an agile coach can contribute with is dependent on the coach. As one practitioner said, "*it depends a lot on that, ... on what level you are ... with your maturity*". Furthermore, the value agile coaches contribute with, is often not easily discernable. For instance, as one participant stated, "*…it's a lot of work behind the scenes. So, no one will ever congratulate the Scrum Master or the Agile Coach for some big success in the project, but they are holding the team together, holding the process there, making sure that everyone is doing the right thing at the right time.*"

Nevertheless, agile coaches add value to those being coached, such as team members, specific roles, teams, departments, or an organization, to become better in what they do. As one agile coach expressed it, an "*... agile coach is the person who helps organization to become their best the same way like usual coach, like life coach helps coachee to decide what to do with their life and to get the most out of this. Agile coaches help the organization but within some boundaries ... so agile coaches know quite a lot about ... agile ways of working, having expertise in this area, while there quite a lot of competencies for agile coaches, this is competence why agile coaches are hired and needed.*" The value of agile coaches is not confined to making teams better in terms of agile practices. Agile coaches also add value by addressing aspects that help teams to

be happy. One of the agile coaches interviewed expressed that an "Agile *coach keeps the mood up, by letting the people feel and understand, that they are always more important than the processes*". In addition, agile coaches deliver value with their knowhow born of their experience and knowledge. As explained by one of the agile coaches, "*one is relaying on his or her experience, and because of that, can actually give practical advice on the matters of agile software development* ".

The value added by agile coaches is difficult to directly measure. None of the interviewed agile coaches reported their contribution having been measured quantitatively with, for instance, a Key Performance Indicators (KPI). The work of the coach is very dependent on the willingness and motivation of the team to work with the agile coach. Therefore, measuring the value should be a mutual responsibility. One practitioner expressed this idea that there has to be "*mutual responsibility. Because I cannot as an agile coach, we are not supposed to make the change, we are supposed to help the people to make change. And if we agree on something and counterparty is not doing this, then we cannot do anything with this.*".

However, when asked about how such value could be measured, their suggestions considered using indicatory measures, i.e., measuring aspects that could be used as indicators of value added. For instance, one participant proposed the 360 degrees feedback method from those who the agile coach worked with. As one participant formulated it, the "*only KPI that I can say right now, is 360 feedback. In case you get positive feedback, it shows that you have been doing something right.*" Such a measure would indicate degree of satisfaction with the work of the agile coach i.e., "*when we are receiving this customer satisfaction surveys, they are positive, they mention for example our efficacy, our value ..., or how things are going in general.*" These measures would indicate the value of an agile coach as perceived by team members. However, the value can also be considered from the perspective of the team. This could be measured, as proposed by the practitioners, clarity of the process and its implementation in the daily work. One participant expressed it as "*...what they need to do every day is clear for them and why do they do the things they do every day, how they translate it in to the bigger plan or the bigger vision, see why is it important, you see people motivated at work*". The idea of measuring the motivation, in particular, its expression in the mood of the team, was also stated. For instance, one agile coach expressed that an indicator is when teams *"... want to do things by themselves and not waiting for someone to give them work to do, they are proactive, if ... yeah it's basically the measurements ... but the biggest indicator is the mood in the room and how people take work*". Another way to measure the value, is to measure the performance of the teams. For instance, one agile coach thought it would be possible to use scrum charts, "*like measuring velocity, the burndown charts*".

5   Discussion

Defining the role of an agile coach can be a challenging task even for practitioners with several years of experience. The literature on the topic has related the role of an agile coach to other well-defined roles such as to that of the scrum master [1, 6]. From the

interviews, we observed that both roles have several goals in common: to help teams with the implementation of agile practices, the achievement of their goals, and to facilitate the whole software development process. However, the interviewees stressed that they also have an educational goal (teaching) both teams and various stakeholders about agile methods and practices. Although coaches work with the team to mainly improve productivity, they emphasize the cooperation and communication of the team as a proxy to achieve the improvement. This is in line with the idea that human factors determine the performance of the team and the process [32].

Agile coaches use a variety of methods and strategies that are aligned to their objectives. Organizing group meetings and workshops are common when the agile coach has the goal of helping the team to identify improvement opportunities or solve a problem. When the coaches aim to educate, they use different strategies ranging from just explaining how to conduct specific practices (i.e., teaching/mentoring) to applying discussion-based meetings where theory and practice are contrasted. Moreover, observation is mentioned as the most frequent method since it is crucial to understand how teams currently work, the needs they have, and the problem they face. In this sense, observation *in situ* becomes a complementary and important method used to understand the context. In this line, Paasivaara and Lassenius [15] indicate that face-to-face communication is very important during coaching.

There seems to be an agreement that there are no silver bullet methods in software development, i.e., practices that work regardless of the context in which they are applied to [33, 34]. This stresses the need of empirical evidence supporting the effectiveness of agile practices in given contexts and ease the selection of agile practices [35]. We found that agile coaches rely on their experience combined with observations to identify the current problems and decide what practices are the best suited for the team. Understanding the problems of a team or organization is a very challenging task and frequently pointed out by the interviewees. The variety of methods used, and the challenges addressed by agile coaches affects what skills are required. An agile coach requires a blend of people skills and a solid understanding of agile practices and methods.

There are additional challenges that agile coaches must deal with. Preserving authority is important since agile coaches cannot decide or enforce decisions. They usually try to influence the team to go in the direction they consider to be the better one. Agile coaches also want to keep friendly relationships since they work daily with the team. However, some interviewees expressed that being friendly can sometimes compromise their authority. The most important challenge that agile coaches pointed out is related to the mindset of team members or managers. Previous experience with plan-driven projects can lead individuals to have a rigid position on how things should be done and create conflicts with agile dynamics. Interestingly, the mindset-problem has been seen often in organizations that embark on an agile transformation journey. In line with existing studies, this supports the fact that agile transformation requires an organization-wide agile mindset [4, 5, 36].

Regarding the value delivered, agile coaches perceive it differently. Some agile coaches express that their results are difficult to measure since they work with the teams to make them better. In this sense, considering the feedback reported by the team that received the coaching can be a meaningful measure. On the other hand, agile coaches

understand that if the team works better, it should be reflected in their performance; thus, using Key Performance Indicators could be a way to indirectly assess their contribution to the team or organization.

6   Limitations

When using the case study methodology, there are threats to validity that should be considered, particularly regarding external validity and reliability [37]. External validity concerns the extent to which the findings can be applied beyond the setting of the study. Our case study represents the perception of eight agile coaches. Thus, these findings do not necessarily extend to cover the role of agile coaches. Although the objective of our study was explorative, further studies are required to confirm our findings. Thus, in line with the inherent limitation of the case study methodology, our results are limited in the extent they can be generalized. Reliability refers to the level of dependency between the results and the researcher, i.e. would the same results be produced if another researcher conducted the study. This threat was to some extent tackled by documenting the case study protocol, following a structured method for encoding, and applying several iterations for data analysis. Another reliability threat refers to the limitation to the coach own perspective. To address this limitation, further studies should include other important stakeholders of this role such as the people/teams being coached, and the sponsors/managers willing to pay for agile coaches in order to achieve a certain effect, impact, return, or value. To facilitate the replication of this study, we provide the interview guideline as supplementary material[3].

7   Conclusion

In this study, we explored the role of the agile coach by using a case study research method. We conducted interviews with several coaches and performed a qualitative analysis. We answered research questions regarding what objectives agile coaches have, what methods they use, what challenges they face, what skills are required by the role, and what value agile coaches perceive themselves to provide.

We found that the role mainly aims to educate and aid teams and stakeholders involved in the organization. To achieve these goals, coaches use different strategies such as observing the behavior of the teams *in situ*. Among the main challenges, coaches face issues to preserve authority and work with organizations or individuals without an agile mindset. The agile coach role requires a blend of people skills and a solid understanding of agile practices and methods, and their value is perceived by mainly improving team dynamics. We believe that our findings contribute to a better understanding of the agile coach role, the development of a professional identity, and offers a characterization that can be useful for practitioners that are new in the role.

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[3]   Interview guideline : `https://doi.org/10.5281/zenodo.4074965`

Acknowledgement

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