

MAIN CONTRIBUTIONS

Chatbots in coaching: Potential and possible applications of digital coaching companions assistants

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Summary

Chatbots are considered to be a key technological innovation of recent years, which is increasingly being used as a digital self-coaching tool in the coaching sector. This article provides an overview of the current development lines of digital coaching companions and assistants. It outlines fields of application in companies, organisations and universities and identifies the potential and challenges of coaching chatbots. The conception and development of chatbots are presented as an interdisciplinary, co-creative and iterative process. The article concludes with an outlook on the future of chatbots in coaching.

Keywords coaching - chatbot - artificial intelligence

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Chatbots in coaching. Potentials and possible applications of digital coaching companions and assistants

Abstract Chatbots are considered to be a decisive technological innovation of the last few years, which is increasingly capturing the coaching sector as a digital selfcoaching tool. This article provides an overview of current developments in digital coaching companions and assistants. Fields of application in companies, organisations and universities are outlined, and potentials and challenges of coaching chatbots are named. The conception and development of coaching chatbots is presented as an interdisciplinary, co-creative and iterative process. The paper concludes with an outlook on the future of chatbots in coaching.

Keywords Coaching - Chatbot - Artificial Intelligence in Coaching

1 Introduction

For most clients, coaching is a very personal and human relationship that is characterised by the empathy of the coaches. In the past, technology was always something that felt somehow inappropriate in the context of the coaching process. Even though many coaches were already using video calls and messenger apps before the pandemic, since the beginning of 2020, coaches and clients have had to radically change their attitude towards technology from one day to the next and quickly adapt to a purely remote coaching world, whether they wanted to or not.

In addition to technologies that we need to bring personal coaching into a digital world (e.g. Zoom, Miro, Calendly), there are also technologies that support and accompany the coaching process itself. These include digital coaching companions such as a chatbot, which acts as a virtual assistant to guide clients through standardisable processes such as clarifying orders or concerns, evaluations, but also through standardised coaching models such as the GROW model. There are also initial chatbot solutions that guide coachees through frequently requested coaching topics such as "resolving conflicts" and "coping with stress", "making decisions" or "preparing feedback".

2 What are chatbots

A chatbot (also known as a conversational agent) is dialogue-based automated software that imitates human conversations in an interactive way. Chatbots are automated dialogue assistants with which you can "chat". The term chatbot is a combination of the words chat and robot (e.g. Barton and Müller 2021).

Chatbots can be integrated into standalone web applications and mobile apps, on websites, but also as virtual assistants in messaging apps. We primarily differentiate between rule-based chatbots and AI chatbots, based on artificial intelligence and natural language processing (NLP) and those that combine the two. Rule-based chatbots follow defined decision paths, which means they always have the same process. They are primarily controlled by user choices and buttons. AI-based chatbots try to recognise the user's intentions from the text input and provide them with suitable answers or try to get closer to the actual topic by asking questions in order to be able to offer meaningful help. To do this, however, they have to draw on so-called learning data (collected data sets) and evaluate whether the users were satisfied with the results they received.

While rule-based bots have a less flexible conversation flow, these guard rails are also a major advantage. Rule-based bots are quicker to create and easy to integrate into existing systems. They are secure and predictable and are not limited to text interactions, i.e. graphic elements such as visualisations and videos can be integrated. They also enable easy handover to a human coach (Lömkker et al. 2021). By providing buttons and a clear path for the client, the communication flow is smoother. Rule-based chatbots are also easy to adapt and change, whereas with machine learning it is more difficult to course-correct if something is going in the wrong direction.

AI-based chatbots learn from collected information; the more data sets are available, the better their answers and questions become. They can also recognise behavioural patterns and potentially have a broader range of decision-making capabilities (Hussain et al. 2019; Ramesh et al. 2017). However, this requires high-quality data on a large scale from which the AI can "learn" in a meaningful way. We are talking here about at least 100,000 to 250,000 data sets, i.e. in our case individual coaching sessions, in order to achieve the first learning results at all; from more than one million, we are really talking about intelligent learning. With data that has not been curated, i.e. checked for quality, the AI can draw conclusions and adopt behaviours that do not correspond to the actual goal. A prominent example of this is Microsoft's chatbot Tay, which wrote racist messages based on analysed Twitter messages shortly after going live and went offline again after just 16 hours.

Combined chatbots, which have a rule-based flow on the one hand, but learn in the long term through the use of AI and support the process at certain points by recognising behavioural patterns, ultimately combine the strengths of both worlds. In view of the rapid pace of technological development, it can be assumed that AI bots will increasingly complement or replace classic rule-based chatbots (Følstad et al. 2019). At the moment, however, most chatbots available on the coaching market are rule-based chatbots with AI elements.

3 Chatbots in coaching

Chatbots are a great way to guide clients through a fully standardised, purely digital coaching process. They can be used as a kind of coaching companion or coach assistant before, after

and also between coaching sessions. They also provide a valuable opportunity for self-reflection for clients (Graßmann and Schermuly 2021; Kanatouri 2020; Terblanche 2020).

Systemic and solution-oriented coaching models and methods often follow structured and standardised process steps. An intelligent and well-designed coaching chatbot can guide coachees step by step along a decision tree structure. The coaching chatbot only needs to be equipped with the right questions for the respective process steps. The interaction is enriched with visualised and gamified coaching methods and tools, such as z. e.g. the wheel of life, constellation boards, techniques from non-violent communication or various scaling questions. These can then be integrated into the coaching process depending on the coachee's topic. This makes a purely digital session easy to handle - and even fun.

As with face-to-face coaching, the coachees are responsible for the content, while the coach avatar - i.e. the identity and visual personification of the digital coaching chatbot - is responsible for the process management of the coaching session. The challenge lies in the careful and professional design of such digital chatbot processes. The expertise of experienced coaches must be involved, and coaching associations should check the quality of the applications for ethical and content standards (e.g. Terblanche 2020). Research institutes then investigate their effectiveness and impact on the entire coaching process.

AI-enriched chatbots could also be used in future through pattern recognition and -The AI can also take on other tasks, for example by suggesting relevant internet resources or feedback and tips on certain topics for the coachees, drawing their attention to existing beliefs or making individual offers for possible topics for self-reflection. For example, an AI could recognise the frequency with which a coachee uses certain words or expressions (e.g. "this is too much for me") over the course of several coaching sessions and draw the coachee's attention to this. This allows stress symptoms to be recognised at an early stage and depression to be prevented.

4 Fields of application in companies, organisations and universities

Most coaching chatbots can be assigned to the application areas of coaching in a professional environment (e.g. personnel development), well-being and mental health as well as use at universities. Based on our diverse practical experience and discussions with customers, users and developers in these areas, we see the following fields of application:

(1) Chatbots as a guide: Is coaching right for me? How do I find the right coach or the right coaching programme? What are the topics I am currently focussing on? Is the offer here also suitable for me? These and other orientation questions from clients can be answered and reflected on quickly and purposefully with a chat offer. They also offer an ideal introduction to coaching and introduce coachees to the benefits of coaching. They also create the need for personal coaching sessions with a human coach.

(2) Chatbots for self-assessment: These chatbots support clients For example, in identifying their own values, needs and motivators or accompanying future students in their search for suitable degree programmes. They are particularly suitable for pre-sorting coaching issues with clients. Coaching with a human coach can build on the coachee's self-assessments in a targeted manner and develop suitable career paths together with the coachee, e.g. in study counselling or career coaching.

(3) Chatbots for self-coaching and self-reflection: Chatbots guide clients through standardised coaching processes on topics such as exam anxiety, coping with stress, giving feedback, making decisions and resolving conflicts. They not only reflect on the current situation, but also work with clients to develop solutions, invite them to change their perspective and integrate many tried-and-tested coaching tools. They thus offer a low-threshold introduction to coaching practice, invite clients to concretise their concerns and work on them in greater depth in subsequent coaching sessions with human coaches.

(4) Chatbots to support personal coaching sessions and coaching programmes: Chatbots can support coaches in a hybrid approach by taking over regularly recurring topics such as clarifying assignments or concerns, worksheets, preparation and follow-up of coaching sessions or a final evaluation. Whether chatbots can recognise the known topic behind the topic when clarifying concerns remains to be seen. However, this is also a major issue in face-to-face coaching sessions. Who knows whether technology will perhaps be able to identify underlying issues even better in the future using certain markers? Enriching or even accompanying individual coaching programmes with chatbots also makes scaling easier for coaches by relieving them of standardisable activities and replacing individual coaching sessions or self-assessments with digitally accompanied chatbot reflections, for example. This allows coaches to focus on the really important topics and have standard topics prepared to increase the effectiveness of their valuable time.

Table 1 Potential and challenges of coaching chatbots

Potentials

Scalable and powerful

Legal

Enable low-threshold, automated feedback

Ethical

Provide individualised, systematic and process-oriented feedback

Stimulate self-reflection processes

Are independent of time and place

Challenges

Data protection

Transparency, goals, human touch "Replacement"

Technical: Dependence on providers, compatibility

5 Potential and challenges

Systemic coaching is increasingly becoming an important tool for reflecting on work processes in companies, organisations and universities (e.g. Lippmann 2013; May 2020). It is no longer only used face-to-face, but also digitally and is no longer just reserved for managers, which also explains the success of digital coaching providers such as CoachHub or BetterUp (Middendorf and Ritter 2021).

Interaction with a chatbot cannot replace coaching between humans and humans, but it does offer some potential (see Table 1): Studies show that users in chatbot interactions show a high willingness to reveal something about themselves because they perceive the system as unbiased and non-judgemental (Lee et al.

2020). Especially with sensitive topics such as coaching, this can lead to clients recognising concerns earlier. In addition, chatbot coaching can be a good preparation for in-depth discussions with coaches, in which clients can then formulate their concerns more specifically. Coaching chatbots are also available around the clock and scalable for a large number of users (Brandtzaeg and Følstad 2017). The current challenges in chatbot development are primarily of a legal, technical and ethical nature (e.g. Rauning 2020). When deciding on a chatbot programme, care should be taken to ensure that data protection is guaranteed and that no conclusions can be drawn about the users, who may disclose sensitive information about themselves during the coaching process. The importance of data protection has already become clear in digital coaching. There are providers that cater specifically to the data protection requirements and online needs of coaching, such as the coaching platform CAI-World, founded by Elke Berninger-Schäfer, which not only enables "secure" online coaching, but also offers a variety of systemic tools, such as system constellations or sociograms, and thus immersive coaching experiences (Berninger-Schäfer 2018).

In the area of chatbot programmes, there are the first providers that make it possible to develop chatbots specifically for coaching (e.g. evoach, see our practical report in this issue) and that focus on the special needs of coaches. There are also numerous so-called no-coding chatbot builders, such as Landbot (www.landbot.io). This is a modular system that coaches can use to "build" a chatbot without any programming knowledge.

With such providers, you need to pay close attention to which data protection regulations they are based on, i.e. you should find out where the user data is stored, who has access to it and in which country the servers on which the data is stored are located. This also determines which data protection regulations apply. Interested coaches who have programming skills and want to be independent of third-party providers can programme a chatbot themselves. There is various freely available software for this, such as Rasa (www.rasa.com). Rasa is a conversational AI, i.e. a platform on which chatbots (in this case: AI-based) can be programmed.

In addition, ethical aspects should definitely be taken into account during chatbot development, i.e. questions about the objectives of the chatbot's use in coaching and what the developer wants to achieve with it (Brown 2020). Good ethical practice is, for example, to make it transparent that a chatbot is a machine and not a human being. It is therefore not about simulating a human coach (as in the well-known Turing test, for example, which tests whether a machine can imitate a human; see Misselhorn 2018 on fundamental ethical issues in human-machine interaction). It is also important that the chatbot clearly states its tasks and also its limits in the interaction so as not to raise false expectations among users.

6 Conception and development

The design and development of coaching chatbots is an interdisciplinary and iterative process in which at least three disciplines must work closely together: Coaching experts, chatbots or conversational designers and programmers/developers. They work together in three overlapping and highly interdependent phases: chatbot design and the conception of the flow, technical chatbot development and training/testing of the chatbot (see Fig. 1). Close and early user involvement is essential in order to develop useful and helpful products.

Fig. 1 Conception and development of chatbots as an interdisciplinary co-creation process.
(Own illustration, V. Mai)

The first step in chatbot development is to define the use case and the target group: For which use case do I want to develop a (coaching) chatbot? What are the "needs & pains" of my target group? What needs of my target group does the chatbot address? We have had good experiences with design thinking workshops in this early development phase at TH Köln (for the principle of design thinking, see e.g. Plattner et al. 2011). In the case of the StudiCoachBot at TH Köln (see our practical report in this issue), we opted for the use case of exam anxiety for the target group of students. In discussions and through the aforementioned design thinking processes, we realised early on that exam anxiety is an important issue for students and that a coaching chatbot can provide low-threshold guidance and support. (These observations are supported by a representative survey on exam anxiety, according to which 9 out of 10 respondents have suffered from exam anxiety at some point - almost two thirds of them during their time at school or university (International University 2022)).

At the same time, the choice of a chatbot programme must be made in this early development phase (see section 5 above): Do I want to or can I programme it myself or do I want to use a no-coding chatbot system? How many resources (time and money) do I have available for chatbot development? At TH Köln, we are working on a long-term chatbot solution and want to be as independent as possible from third-party providers, so we have opted for the AI-based system Rasa. At the same time, we are also working with the chatbot builder Landbot, which enables us to implement smaller chatbot projects without the need for programming skills.

The next major step is to develop a bot persona: What personality should my chatbot have? Should it be a coaching expert or an (experienced) colleague? Should it be human or a fantasy character? What name does it have? What character and personality traits characterise them in the interaction? Should they be on a first-name or first-name basis? This step is often underestimated; however, for later phases in which the interaction scripts are created, it is essential to have developed a consistent chatbot personality that is visible in the type of reactions and feedback. Design thinking methods can also be helpful here. We designed the StudiCoachBot at TH Köln as a coaching expert that shows closeness to the users, e.g. by using the first name and a relaxed tone.

The development of content and interaction scripts for the chatbot can only be successful if the previous steps have been well planned. A clearly defined use case is a prerequisite for being able to help users interact with the chatbot. Clearly structured coaching methods are a good way to guide users through the process. Rule-based systems in particular, which still make up the majority of chatbots, cannot respond to unforeseen user input. This must be taken into account when creating the interaction scripts. This is where it becomes particularly clear why a close exchange with developers/programmers must take place at this point at the latest.

After programming or entering content and initial revision loops, the chatbot can be deployed, i.e. put online for users to enable early testing with the target group. The results are then used for further development. This iterative process of design, development and testing is illustrated in Fig. 1.

In all the development steps described here, it makes sense to involve the target group at an early stage and test the use case, the bot persona and initial interactions via user tests, for example. Programmers should be closely involved here. At TH Köln, for example, we are also working closely with students from various degree programmes who are helping to develop the StudiCoachBot in an interdisciplinary and co-creative way. The first interaction script was z. For example, it was developed as part of a Master's thesis in the Market and Media Research degree programme; two Master's students from the Mechanical Engineering - Smart Systems/Sociotechnical Systems degree programme are involved in the programming. Students from social science and engineering degree programmes continuously evaluate both the technical and conceptual implementation of the StudiCoachBot as part of project work, student research projects and bachelor's theses.

It is highly recommended not to lose the playful approach and the joy of chatbot development. In addition to the early involvement of users, it can also be interesting - for companies and universities - to carry out accompanying evaluations on acceptance, effectiveness and usability. Research on chatbot coaching is still in its infancy and can provide important insights into the use of chatbots in coaching. At TH Köln, we would like to make a contribution to this.

7 The future of chatbots in coaching

Coaching chatbots are only just beginning to be utilised. Many things will gradually become more established over the next few years, and the wide-ranging possibilities offered by the use of artificial intelligence can hardly be estimated at present. The digital coaching market is developing rapidly and the work of coaches will be supported more and more by digital coaching companions in the future (e.g. Clutterbuck 2022). The younger and more digital target group in particular is open to the use of chatbots in general and coaching chatbots in particular, both on the coach and client side.

In this context, blended or hybrid coaching has long been a common term for programmes that combine classic face-to-face coaching with digital elements (e.g. Kanatouri 2020; Geißler et al. 2013). This means that personal support in analogue coaching is combined with a digital offering in the form of online coaching and/or chatbot coaching. The use of technology refers not only to self-coaching elements such as chatbots, but also to online elements such as the use of virtual reality. In virtual reality (VR) coaching, computer simulations can be used to create virtual worlds in which coaches and coachees can "immerse" themselves with VR glasses.

This enables the realistic perception of a virtual world (immersion). There is potential for both individual and group or team coaching sessions in which the participants cannot come together in person. Realistic collaboration, e.g. in a virtual coaching room, can enable empathic interactions that can be experienced more intensively than in digital space (e.g. via Zoom). Systemic interventions that reach their limits in the digital space (e.g. constellation work) can be made possible and experienced in the VR space. VR interactions can also encourage participants to change their perspective, as study results suggest (for an initial overview, see Ebermann 2017).

In the coming years, coaching chatbots will increasingly evolve into virtual agents that can communicate not only via text, but also via spoken language. So-called chatbot avatars will also have a face and interact with users via gestures and facial expressions. There are already notable developments in the field of social bots. Social bots are designed as virtual companions and empathetic "AI friends". One well-known social bot is Replika (www.replika.com). Here, users can "create" a personal friend by choosing their appearance and personality, for example. Thanks to the AI elements of the chatbot, the programme continuously learns as more interactions take place and is able to conduct increasingly complex conversations. As a result, users sometimes enter into long-term relationships with Replika. Replika was originally designed to feed it with text modules from the developer's deceased friend so that it could continue to talk to him even after his death (for research on chatbot relationships, see e.g. Skjuve et al. 2022).

These developments present designers and programmers of coaching chatbots with new challenges in design and development. Even with voice-based chatbots that are controlled purely via spoken language, questions such as tonality and gender must be answered. Ethical and data protection aspects become more relevant the more data is collected from users.

In terms of content, we can assume that standard processes and clearly structured coaching methods will be increasingly supplemented and in some cases replaced by the use of chatbots

in the future (e.g. Graßmann and Schermuly 2021). Established coaching processes and methods will be further professionalised and improved through digitalisation and improved evaluation options as well as accompanying research. AI-based chatbots in particular will be able to "play out" their great strength of pattern recognition and support human coaches in recognising certain topics or concerns in the coachees' statements. In this sense, they will also be able to accompany coaches as sparring partners or supervisors (e.g. Clutterbuck 2022). This means that they will be able to ask typical reflection questions from supervision and even analyse and provide insights from video recordings, as is already possible with the AI provider Ovida for the analysis of coaching sessions on a video basis (www.ovidia.org).

However, coaches will continue to be able to utilise their human skills to the full in this environment, as the addition of self-reflection and a personal exchange with clients is still seen by them as an irreplaceable and essential success factor in coaching. Being understood and recognised by others will remain a fundamental human need, and this factor cannot be replaced by chatting robots in the near future. And so coaching chatbots are currently not being designed as a human replacement, but rather as a supplement and support. They can establish low-threshold contact and demonstrate their great strength in pattern recognition. In this area, they are certainly superior to human coaches - as we know from the use of AI as an assistance system in medical diagnosis. In future, AI assistants in coaching will be able to analyse the course of conversations between human coaches and coachees and summarise typical topics, statements, etc. of the coachee for the coach. They may even be able to make recommendations for interventions based on these analyses. It can be assumed that an AI assistant will act even more impartially here than a human coach. However, the decision on next steps and interventions must remain with the coach. Especially as the skills of empathy and intuition, which are important for coaching, are not available to robots.

Blended or hybrid coaching (i.e. the combination of analogue, digital and chatbot coaching) will therefore be the future, in which digital services support and complement human-to-human interaction (see also an empirical study on the opportunities and limitations of AI-based coaching; Börner and Wallraff 2022). This requires coaches to be willing to engage with the new technologies and integrate them into their services in a meaningful way. However, it also offers a great opportunity to move away from simply selling coaching on an hourly basis, to scale themselves and their expertise and to give more coachees access to their own coaching services.

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Literature

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