Design and Implementation of an Intelligent Onboarding Assistant

Lappeenranta–Lahti University of Technology LUT

Bachelor's Programme in Software and Systems Engineering DD, Bachelor's thesis.

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Examiner(s): Professor Dominik Siemon

Abstract

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Onboarding training plays a crucial role in today's business development process. Its existence determines whether new employees can understand the company culture, familiarize themselves with the company system, and meet the company's technical requirements. However, the training processes of most companies currently do not meet these requirements very well. In this article, I will examine the current onboarding training process by studying relevant literature, explore the necessity of improving training methods, and the possibility of integrating artificial intelligence into onboarding training. And by using and comparing existing onboarding training platforms, examine the basic functions and limitations of these platforms. By publishing and collecting survey questionnaires. I have collected a lot of feedback and needs from company employees regarding the current onboarding training. Finally, I will describe how to achieve the vision of the intelligent onboarding assistant OTTO by accessing its rich training materials using the TalentLMS API, building an intelligent onboarding assistant using LLM, and integrating the intelligent assistant into Microsoft Teams.

Abbreviations

AI	Artificial intelligence
ML	Machine learning
NLP	Natural language processing
LMS	Learning management system
LLM	Large language model
AIM	Automated intelligent monitoring
DLASM	Deep learning-assisted statistical model
DETE	Department of education, training and employment
RDC	Red Deer College
XAI	Explainable artificial intelligence
DL	Deep learning
HR	Human resources

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1 Introduction

In today's business environment, the onboarding process for new hires has become a crucial determinant of their future engagement, productivity, and retention (Dickson & Isaiah, 2024). As organizations evolve with technological advancements and changing workplace dynamics, especially the increasing popularity of remote work, traditional onboarding methods are undergoing reassessment. With the advent of Internet 4.0, direct human-computer interaction is gaining traction, fueled by the rapid rise and widespread adoption of artificial intelligence (AI) technologies such as large language models (LLM), machine learning (ML), and algorithm-driven social bots, which play a pivotal role in disseminating information online and facilitating users' online learning (Nardo et al., 2020). Consequently, AI technologies have started to be integrated into areas such as learning and training, making interactions more natural and efficient. In the modern era, with further advancements in AI technologies like natural language processing (NLP) and deep learning (DL), AI transcends its role as a mere tool for employee training. Instead, it personalizes the new employee experience, predicting and resolving potential issues by analyzing historical data (Kudliskis, 2014; Liu & Ge, 2023). During the pandemic, most new hires could not receive standardized training at their companies and had to rely on online platforms such as Zoom and Teams (Adedoyin & Soykan, 2020). The surge in remote working has spurred the demand for and development of sophisticated onboarding assistant features.

AI has proven to be extremely beneficial in the learning domain (Holmes & Tuomi, 2022; Neumann et al., 2023), and I believe its application in onboarding will increasingly become a mainstream trend in corporate training, offering more efficient, personalized, and flexible solutions for training new employees. I aim to develop an intelligent onboarding assistant named OTTO, which I have designed to integrate with Teams. OTTO can automatically generate personalized learning paths and plans based on the backgrounds, skill levels, and learning needs of new employees. By analyzing an employee’s learning history and competencies, OTTO can tailor training content and learning paths to meet individual development needs. Furthermore, OTTO serves as an intelligent mentor for new hires, offering real-time guidance and support. Employing speech recognition and NLP

technologies, OTTO interacts with new employees, aiding their learning, responding to inquiries, providing advice, and addressing work-related challenges.

1.1 Objectives and Goals

The primary aim of this article is to conduct foundational research to ensure that OTTO meets the employee training requirements of most companies and is ready for implementation upon development.

The main objectives of this paper are:

- Conduct a review of relevant literature to assess the current state of induction training and its deficiencies, and to explore the necessity for OTTO.
- Utilize surveys to collect data on employee needs for training and intelligent assistants.
- Evaluate the features, as well as the advantages and disadvantages, of current mainstream onboarding platforms through usage and comparison.
- Simulate the implementation of OTTO, focusing on accessing training materials, constructing intelligent assistants, and integrating these systems.

Through this research, I will gain insights into the user needs of staff and the implementation strategy for OTTO, which will be immensely beneficial in its subsequent development.

1.2 Structure of the Thesis

This paper investigates the role of intelligent onboarding assistants and the feasibility of implementing OTTO. In chapter 2, I analyze the employee onboarding process and its constraints in modern organizations using relevant literature. Additionally, I will examine how current onboarding strategies are evolving from traditional models to more personalized, AI-driven processes. Furthermore, I will investigate how intelligent onboarding systems can enhance the onboarding experience and efficiency through

advanced technologies such as AI and ML, ultimately providing long-term benefits to organizations.

In chapters 3, I will examine both the potential and underexplored aspects of current training methods in fulfilling user needs by utilizing and comparing prominent learning management system (LMS) training platforms available today. This analysis will yield valuable insights and serve as inspiration for the development and implementation of OTTO.

In chapter 4, I will gather and assess the shortcomings of prevailing training methodologies via a questionnaire, and delineate the specific user needs that OTTO should address.

In chapter 5, I detail potential implementations of OTTO in three key areas: accessing TalentLMS management tools and learning materials via API, constructing the intelligent assistant, and exploring integration methods. Through this approach, I provide a potential framework for the development and implementation of OTTO.

2 Related Research

In this section, I will provide a detailed description of the onboarding processes employed by contemporary companies and analyze their impact on employees and organizations. Subsequently, I will examine their limitations using pertinent data. Furthermore, I will utilize literature to illustrate how the incorporation of AI into the onboarding process enhances employee learning efficiency. Through this analysis, I will underscore the role and necessity of intelligent onboarding assistants.

2.1 Current Onboarding Processes and Limitations

Induction training is an essential part of most modern companies. It allows the company to integrate new talent effectively, ensuring that all trained recruits understand the company's culture and rules, as well as acquire the necessary skills for their roles. This ensures that employees are quickly assimilated into the company. Unlike the antiquated sink-or-swim ethos of yesteryears (Elset, 2018), contemporary onboarding is more humanized, suggesting that companies should optimize their onboarding processes to facilitate a smooth transition for new employees into their work environment.

However, onboarding still presents numerous challenges for many organizations. Research indicates that nearly 17 percent of employees opt to leave their jobs within three months of starting, and half of hourly employees depart within the first 120 days. Additionally, half of senior external hires fail to transition into their new roles within 18 months (Becker & Bish, 2021). These statistics may suggest that a company's onboarding program may not sufficiently prepare employees to perform their jobs effectively.

A survey by the Aberdeen Group highlights these concerns (Laurano, 2013), noting that onboarding is one of the least mature markets in the talent management technology space. As of 2013, only 13% of organizations had a fully automated onboarding process, 54% had a partially automated process, and 34% still relied on a paper-based process. Thus, this signifies that most companies usually do not have a standardized training process, or this may be a complex procedure which hinders the onboarding experience for most employees.

The use of a well-structured onboarding program has been proven to be a successful way of quickly integrating new employees into the organization, which in turn leads to higher retention rates and better customer service quality. Well designed and rigorous programs of onboarding are the key for the effective integration of new employees in organizational culture and ensuring their best performance (Noble, 2019). This is achieved through the new staff members being able to get a better idea of the organization's goals, vision as well as its job descriptions which translates to them achieving their outputs fast.

The conventional onboarding training faced difficulties during the pandemic too. The pandemic of COVID-19 changed the form of the main work of many companies, as they shifted to remote orientation for employees. A survey of 16 respondents from different business sectors such as media, IT, fintech, e-commerce, and advertising together showed that most companies followed no particular remote onboarding and e-training procedure (Koluaçık, 2023). This frequently led to confusion and stress among the newly hired employees, which in turn made their adaptation into the company more difficult. The effectiveness of the buddy system was mentioned, but there was a constant change in the manner of its implementation. As for the newcomers, unfortunately, they sometimes met buddies who weren't well-informed enough or didn't invest in their support enough (Scott et al., 2022). Apart from that, the volume of information given to new employees often resulted in a lot of stress and hindered the process of effective learning and adaptation. Remote environments substantially reduce opportunities for observational learning, which is vital for understanding company culture and informal workflows. Consequently, there is a pressing need for well-structured remote onboarding and e-training processes, as well as personalized buddy systems, to ensure effective support for new hires.

2.2 Significance of the Research

Numerous studies have demonstrated that effective onboarding significantly influences employee retention, job satisfaction, and overall performance (Bauer & Erdogan, 2011). In response to the current inefficient and unstandardized training processes, I aim to develop a new form of onboarding. By integrating cutting-edge AI technologies, I am able to construct a smart assistant that offers a personalized and automated onboarding approach.

Various training approaches already incorporate AI. For instance, Martin Balfroid et al. utilize AI to automatically generate code tours that assist new developers in rapidly acclimating to their current tasks (Balfroid et al., 2024). Using LLM, AI is capable of summarizing and annotating the existing code automatically. This substantially reduces the time veterans spend explaining tasks to new employees and accelerates the newcomers' comprehension of the codebase, enabling them to become proficient more swiftly.

While cognitive AI is currently focused on solving specific problems, it is increasingly being applied in on-the-job training. IBM's AI pioneer, Watson, enhances the employee onboarding experience with a ML platform that adapts to priority levels (Trends, 2017). This platform personalizes the learning experience using cognitive technologies and AI, making learning more efficient by adapting content to an individual's learning pace and style. It also analyzes employee feedback and behavior patterns, enabling human resources (HR) departments to better understand employee needs and issues, thus allowing for the design of more effective training programs and workplace improvements.

When a company conducts employee training, those responsible for the training also constitute a part of the budget. AI then tackles the challenge of providing qualified trainers in environments with limited budgets and manpower, reducing staffing requirements and enhancing the quality and speed of training. The automated intelligent monitoring (AIM) system automates and enhances the training process through the use of diverse AI algorithms (Wallace & Valdivia, 2019). Within the context of the partial mission training system for the Q-7 UAV, the application of the AIM framework significantly reduces the time trainees need to acquire essential skills and diminishes the reliance on human trainers. Consequently, automated AI systems are demonstrated to improve the quality and speed of training and can enhance the learning experience by providing timely feedback and adjustments based on real-time data.

Intelligent training assistants have proven highly effective in real-world applications. For instance, Mohaned Adile et al. introduced deep learning-assisted statistical model (DLASM) to enhance the effectiveness of workplace safety training for healthcare workers (Adile et al., 2023). Healthcare is inherently associated with risks such as disease transmission, physical injuries, and exposure to hazardous substances. Consequently, healthcare workers require effective safety training to mitigate these risks. Mohaned Adile et al. trained the

model using the workplace health and safety injury and illness dataset provided by the department of education, training and employment (DETE). The implementation of DLASM in healthcare worker training simulations utilized a deep neural network to analyze the data and predict safety incidents. Features extracted from the training data were used to assess the model's effectiveness. The results demonstrated that DLASM improved efficiency, accuracy, and predictability in predicting safety incidents over traditional methods. In terms of performance, it also showed high precision, high recall, high accuracy, and a high F-score. This illustrates that implementing DLASM can lead to more effective safety training, potentially reducing accidents and injuries in the workplace.

All of the above evidence underscores the feasibility of applying AI to the training process. It also instills strong confidence in my research on OTTO. I believe that OTTO can provide a smarter and more efficient training experience for onboarders.

3 Comparison of onboarding platforms

In this chapter, I will focus on LMS, which are mainstream online learning tools. By using and comparing widely utilized LMS platforms, such as Canvas and TalentLMS, I aim to uncover the strengths and limitations of each. This analysis will provide valuable insights and inspiration for the development and implementation of OTTO.

3.1 LMS

LMS is a software application or web-based platform designed to assist organizations in planning, executing, and evaluating the learning process. The implementation of OTTO also heavily relies on this system. LMSs are typically used in corporate training and education spaces and are capable of handling functions such as course registration, course management, user interaction, progress monitoring, and grade recording. The primary advantage of these systems is that they provide a centralized learning space, making learning content accessible anytime and anywhere, and support administrators in monitoring and evaluating learner performance.

According to a study by JAMK University of Applied Sciences (Kassymtayeva, 2020), user satisfaction with current onboarding was derived from 200 user reviews collected from four LMS review sites. These reviews were analyzed, along with an employee survey collected from 80 respondents. The majority felt that LMS functionality significantly impacts onboarding satisfaction, especially in administrative and talent management aspects. The Red Deer College (RDC) Library implemented an LMS to facilitate staff training, onboarding, and professional development. Specific courses such as Blackboard 101 and One Service Desk were developed to guide and train staff. Instructional staff were trained in the effective use of the LMS, and ultimately, the LMS-based training model resulted in improved employee performance and increased flexibility in training delivery. This illustrates the effectiveness of the LMS in training employees.

3.2 Canvas LMS

Canvas LMS, developed by Instructure (*Canvas by Instructure | World's #1 Teaching and Learning Software*, 2024), is a widely used online LMS primarily employed in the education sector, but it is also utilized by many businesses and organizations for training and professional development. Canvas provides an integrated platform for course management, online learning, and performance assessment. It includes versions tailored for both teachers and students.

3.2.1 Teacher View

Canvas LMS features a relatively simple interface. It allows coaches to build courses in various formats, including documents, videos, and PowerPoint presentations. It is also possible to add quizzes and assignments to courses to monitor user learning. This capability greatly assists in personalizing the learning experience for employees.

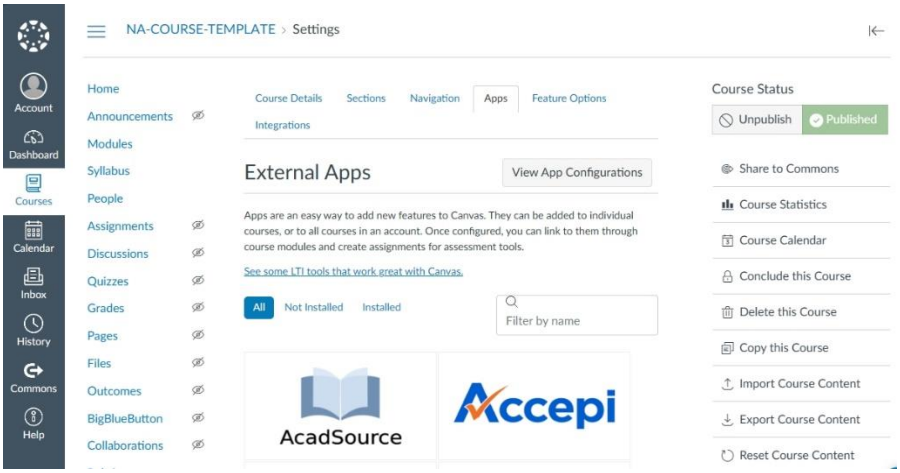

Figure 1 Carven setting

On the one hand, Canvas can be configured to integrate with a wide range of external applications, by recognizing OTTOs. It helps the OTTOs to have uninhibited access to the courses that are created by these coaches. The system is programmed to analyze the

assignments and quizzes submitted by the employees and it gives solutions based on the errors that are identified, as well as providing training materials that will help the employees to improve their knowledge. This approach drastically cuts the time coaches need to be physically present at the training, and instead, provides personalized problem-solving instead of low-quality information which is taken from web searches in a broad sense.

Apart from that, Canvas has a separate “Commons” module for sharing resources with the community. In Commons, teachers can put their created course content or other educational resources that they have made on the Canvas platform and share them with other Canvas users. It is very versatile and can range from being completely open to the public to being paradoxically accessible only to a certain group of users or one specific institution. Instructors can also avail teaching resources submitted by other participants of the Commons and integrate these resources to their courses, that can really make a significant variety of content and teaching methods.

3.2.2 Student View

The platform also provides a student view preview mode, which allows instructors to see how course content and interfaces will appear from a student’s perspective. This feature ensures that all course materials and activities are delivered as intended.

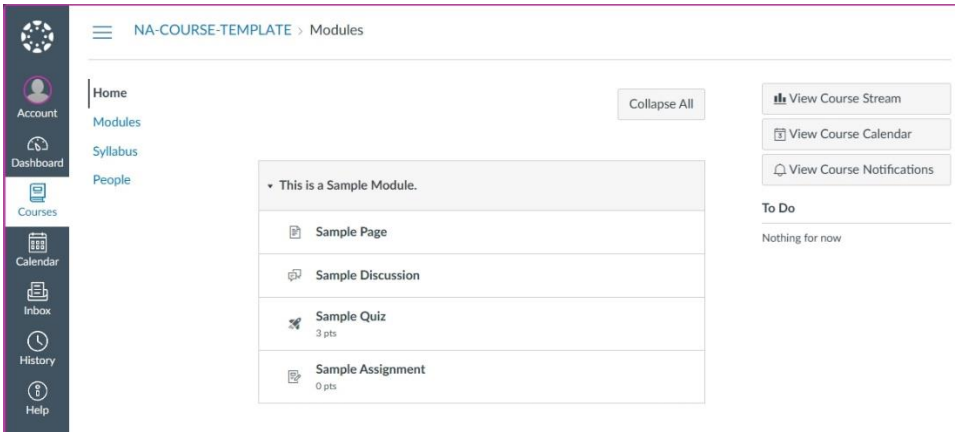

Figure 2 Carven student view

3.3 TalentLMS

TalentLMS is an eLearning platform dedicated to corporate training, aimed at helping teams excel and organizations become more intelligent (*TalentLMS: The #1 Cloud LMS Software for Online Learning*, 2024). With its strict grading system and robust training features, it ensures a superior user experience for managers, coaches, and students alike. To fully assess the strengths and limitations of TalentLMS, I intend to explore the platform from three different perspectives: as a manager, a coach, and a learner.

3.3.1 Administrator

TalentLMS provides managers with an extremely high level of authority to keep a tight rein on their employees. Managers can add employee information into the job training system. The mandatory information to be provided is first name, last name, e-mail address, and username. The password will automatically generate a strong password if it is not set manually. In addition, managers can set user types for employees and determine user permission levels, so as to rationally allocate resources and administrative privileges. In order to adapt to the globalized working environment, administrators can set time zones and languages for users to ensure that employees can receive training at the most suitable time and in the most familiar language. Additionally, company information security can be further protected by setting automatic account deactivation times. Administrators can also customize user notification preferences, such as setting users not to receive communications other than essential information such as password resets.

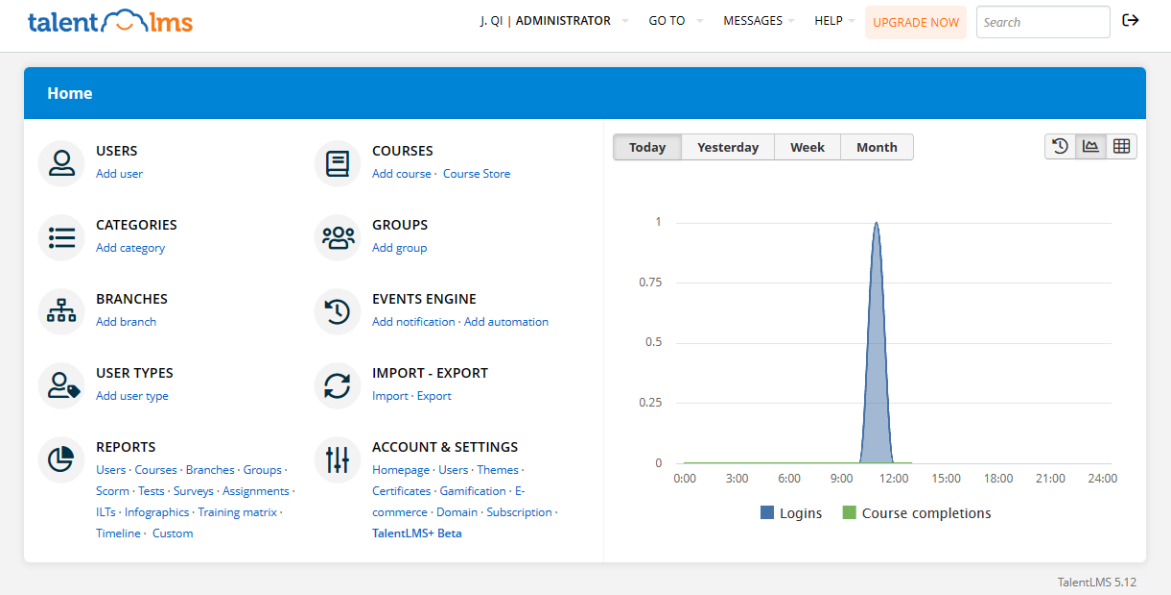

Figure 3 TalentLMS administrator view

TalentLMS greatly simplifies the process for managers to design training programs. Its course store offers a diverse array of both free and paid resources, enabling managers to select content that meets their company's needs and incorporate it into employee training tasks. Beyond leveraging the course store, TalentLMS equips managers with the tools to create and categorize their own courses. Managers can create courses of different forms to suit different learning styles such as videos, text files, as well as presentation slides. After the training, the instructor or the administrator can conduct quizzes to test the users' learning. In addition, TalentLMS has very useful tools for data visualization that enables supervisors to follow learners' progress and the quality of their learning, enabling them to offer personalized coaching and support.

3.3.2 Learner

The learner interface in TalentLMS is nicely arranged and easy to use. Its home page features the current courses of employees, with each course icon indicating the progress that has been made. Some other information situated above the course details shows the total learning hours and the number of completed courses of the learners. Furthermore, TalentLMS

furnishes learners with various functionalities such as group discussions and study calendars to better organize their learning trajectory.

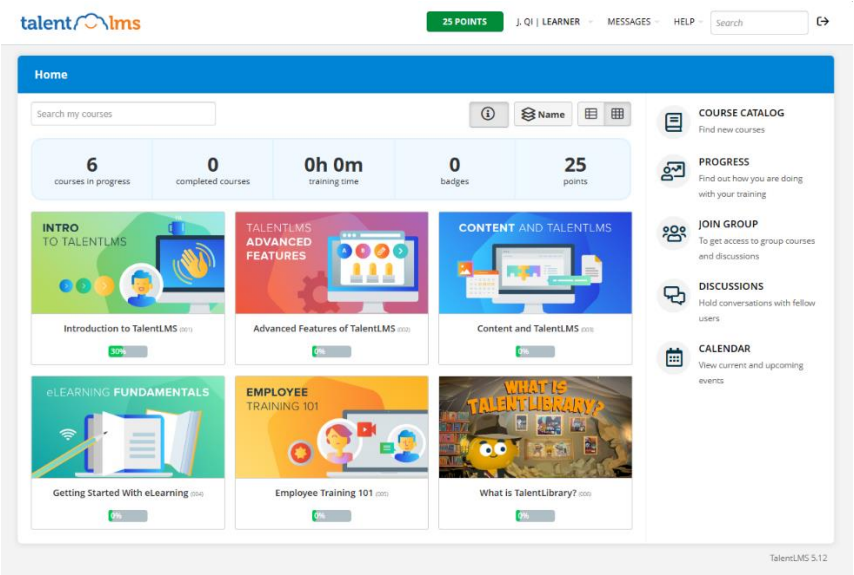

Figure 4 TalentLMS learner view

TalentLMS incorporates a reward system where learners earn points by engaging with courses or completing them to gain certificates and badges. Subsequently, learners can advance through these rewards. A leaderboard within TalentLMS ranks employees based on points and levels, allowing the company to offer rewards or promotional opportunities based on their performance in TalentLMS.

TalentLMS utilizes visual data to provide learners with detailed reports on their learning status and progress. Additionally, TalentLMS offers a basic method for discussion, enabling users to contribute to forums. However, the discussion tool is not segmented into detailed boards, which may increase the inquiry cost for learners.

3.3.3 Instructor

The instructor interface mirrors that of the learner, facilitating instructors' ability to view courses from the learners' perspective and ensure that course materials are appropriately accessible.

Moreover, instructors have several administrative functions. They can edit and update course content to keep the instructional materials current and relevant. Instructors can also create groups or events, which are invaluable for enhancing learner training.

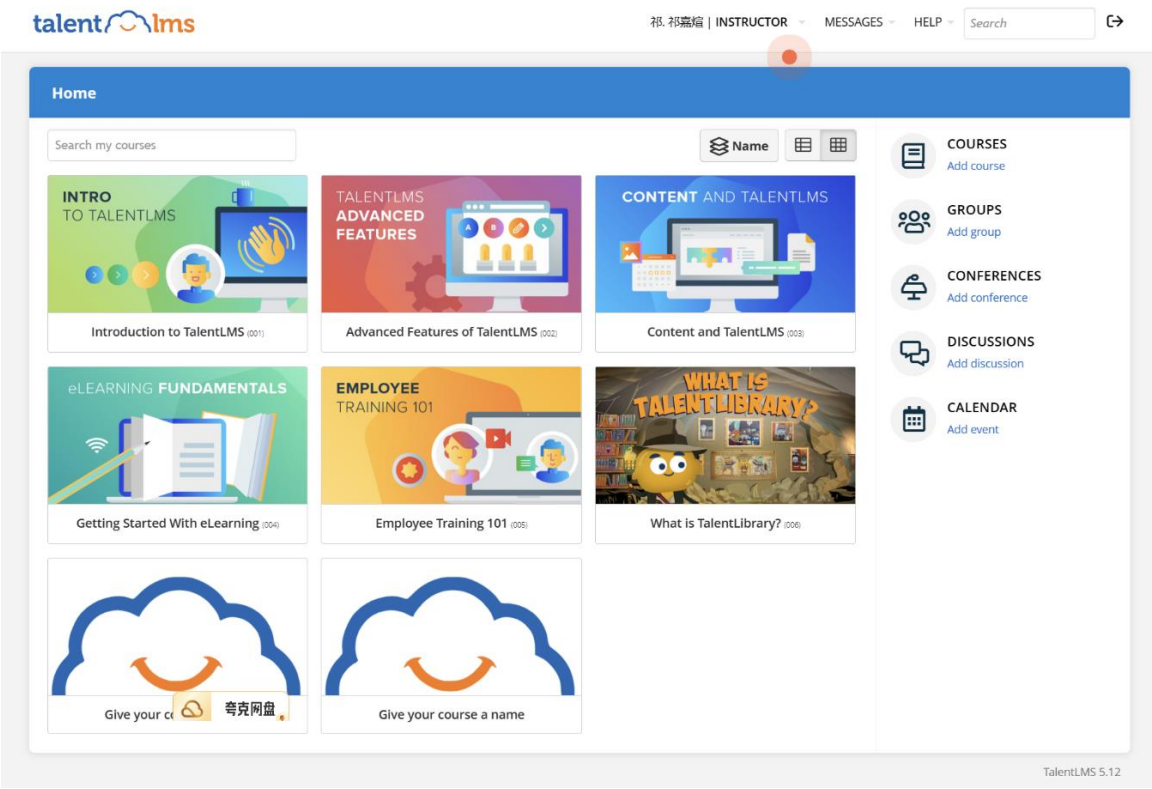

Figure 5 TalentLMS instructor view

Overall, instructors can utilize meetings and events to conduct summaries of training reports, review learner progress, evaluate training effectiveness, and make recommendations for improvements. Instructors serve not only as knowledge providers but also as evaluators and feedback sources, significantly influencing the success of the training program.

3.4 Advantages and Limitations

By comparing two leading LMS, Canvas and TalentLMS, this study aims to explore their utility in corporate training. The assessments have shown clearly that both the platforms provide key features like the learning calendars and comprehensive variety of available online courses.

Canvas LMS has a strong integration system which allows it to download applications from external sources, hence enhancing the employee learning process and making the training process more customizable.

TalentLMS, which you have probably already heard of, is used by many big companies and can efficiently differentiate the learners, administrators, and instructors. This structured approach makes managing the onboarding process very compact. In addition, TalentLMS offers advanced visualization tools that both employees and leaders can use to track detailed progress comprehensively.

Nevertheless, both systems lack robust communication and online meeting tools, posing challenges for online teaching and enhancing interactions between employees and coaches. Despite these limitations, OTTO can leverage its high-quality training materials and management system to develop a more comprehensive training platform.

4 Research Method

In this chapter, I will utilize a questionnaire to gather a broad range of staff perspectives on the current training methods within the company and their expectations for an intelligent training assistant. This approach aims to inspire how OTTO can fulfill user needs.

4.1 Questionnaire Design

I employed Webprop to create my survey questionnaire, which comprises 10 questions. It includes queries about employee satisfaction with the training process, their opinions on current training methods, and their expectations for an intelligent onboarding assistant. The goal was to identify issues with the current training model and to explore the users' needs for an intelligent training assistant.

4.2 Data Analysis

Webropol provides comprehensive reporting capabilities, including visual display of data and detailed charts. These functions make the summary of questionnaire data more effective. In order to analyze the questionnaire data more deeply, I used two data analysis methods: quantitative and qualitative.

For quantitative data, I used descriptive statistical methods, including mean, percentage, and frequency distribution.

For qualitative data, webropol has made open questions into tables for easier reading. At the same time, I conducted an analysis of the following steps:

1. Preliminary reading: Read through all the answers to gain a preliminary understanding of the overall content of the data.

2. Data cleaning: Remove meaningless answers.

3. Summarize keywords: Summarize the keywords that appear more frequently in the answers obtained.

Based on the above steps, I have summarized the questionnaire data.

4.3 Results

Upon distributing the questionnaire via Pollpool, I collected a total of 11 responses. Surprisingly, all respondents had undergone onboarding training, yet none of their companies had employed any platforms to train their employees internally. The employees rated their company's onboarding experience as relatively low, with an average score of 5.7 out of 10.

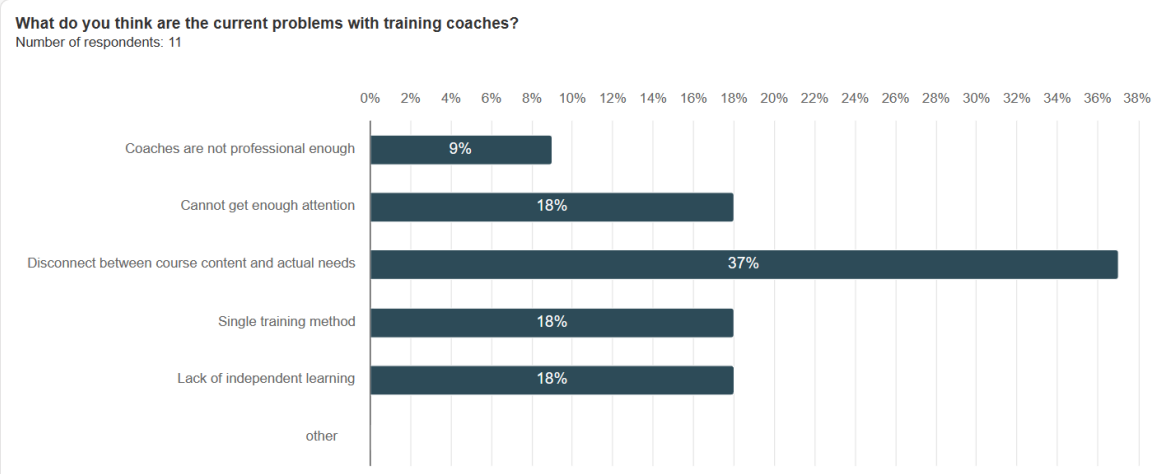

Figure 6 Results of the question "What do you think are the current problems with training coaches?"

Regarding the training of trainers, 37% believe that the content of the courses they teach is out of touch with actual needs, and a significant number believe that the current training methods are rather one-dimensional, do not receive enough attention from trainers, or lack the time for independent learning. At the same time, the lack of sufficient training resources was cited by the largest number of people as a challenge to current training methods, followed by the perception that the content of the training is less relevant to the job.

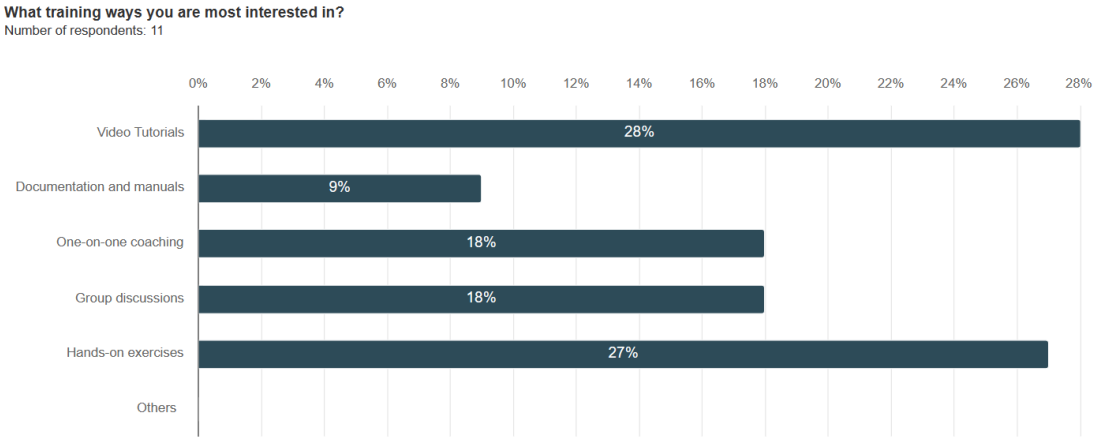

Figure 7 Results of the question " What training ways you are most interested in?"

In terms of enhancing the training experience, over half of the employees expressed a desire for training that improves job skills, followed by teamwork and adaptability to the work environment. As for preferred training methods, most employees favored video tutorials and manual exercises, with one-on-one training and group discussions also being popular.

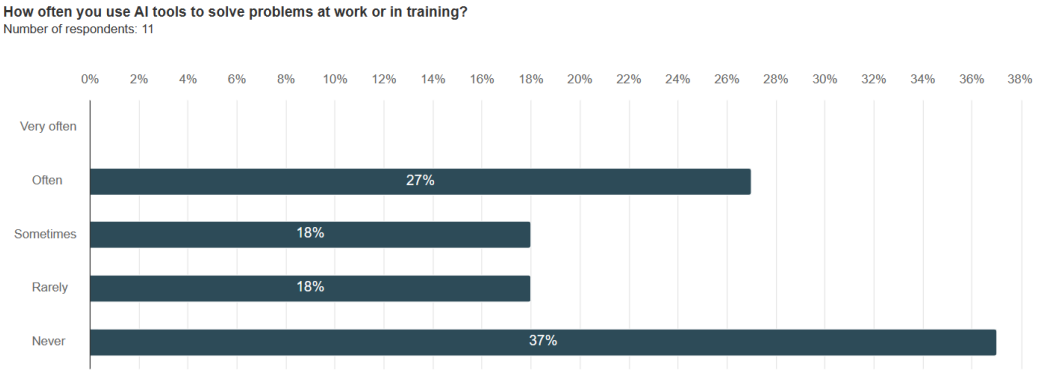

Figure 8 Results of the question " How often you use AI tools to solve problems at work or in training?"

AI is already a significant component of training and work for employees, with 63% of respondents having used AI tools to address challenges in training or on the job, while 37% have never used AI tools for these purposes. This indicates that employees have a foundational understanding of AI, which facilitates the implementation and broad promotion

of OTTO within the company. Additionally, several respondents offered valuable suggestions for OTTO. I have summarized them into several key words:

- Simple.
- Exercises and activities.
- In-person interactions.
- Feedback methods.
- Video tutorials.

I believe OTTO should concentrate on skill-based training for employees. Furthermore, OTTO should be equipped with extensive training materials, particularly training videos. Following these videos, there should be exercises to help employees consolidate their knowledge. Additionally, OTTO should be user-friendly, allowing new employees to quickly become proficient without being overwhelmed by complex features.

5 Implementation of OTTO

In this section, I will focus on the implementation of OTTO. According to previous research, although the existing LMS platform does not have useful chat and meeting tools, it has powerful management functions and rich training materials. So I plan to use the TalentLMS API to manage employees and courses. This is of great help in enriching OTTO's management capabilities and training quality. Meanwhile, based on previous research, it has been found that a personalized onboarding process is of great help to companies. Therefore, I will use relevant literature to study the characteristics that OTTO should possess. Finally, in order to better integrate OTTO into the employee training process. I plan to integrate OTTO into Teams. Through this approach, employees can use OTTO at any time during work to solve problems in daily life.

5.1 TalentLMS Application Programming Interface (API)

TalentLMS offers a robust API to facilitate the external use of TalentLMS by users or organizations across various functions (*Can I Integrate My Site with TalentLMS?* 2024). By utilizing the API, I intend for OTTO to integrate its advanced user management features to ensure that managers and coaches can monitor their employees' learning progress effectively. Additionally, I want OTTO to have access to its comprehensive training materials to enhance user learning.

5.2 User Management

Through the TalentLMS API, user management functions can be automated and remotely managed across multiple levels, thereby significantly enhancing efficiency. For instance, the API enables administrators to add or remove users remotely, modify user statuses (e.g., activated or deactivated), and gather detailed information about users, such as courses attended, progress status, and more. In addition, the API supports single sign-on functionality which allows the individual to access the learning platform without having to login multiple times. These features enable administrators to supervise and promote the

learning process effectively, thus ensuring that users can finish their training courses successfully.

5.2.1 Training Material Access

The TalentLMS API allows for robust access to courses. With the API, administrators and coaches can get the detailed course information such as the course descriptions, learning content, participant details, learning progress, and even dynamically enroll or unenroll users in courses. Moreover, the API significantly facilitates access and management of course categories, which is an essential part of systematically organizing and delivering learning content.

Beyond that, coaches can get a broad array of high-quality training materials from the API directly into TalentLMS and substantially reduce the time and labor costs associated with developing organization-oriented training materials.

With these functionalities, OTTO can provide each user with a personalized learning experience, adapting the content and support according to their learning progress.

5.3 Building Intelligent Assistants with LLM

LLM, consisting of AI, designated for teaching an already existing language model which is approximately capable of comprehending human speech to an extent and responding to the queries (Kasneci et al., 2023). In this part, I will talk about LLM-related technologies and show how OTTO can design more intelligent chatbots and interactive assistants using these advanced models.

5.3.1 Emotion

An experienced mentor is indispensable for the novice employee; this person should be friendly and helpful enough to inform the novice employee enough during the training period and inculcate a willingness to remain with the company. An ideal mentor not only offers technical support and instruction needed but also emotional support that will help us to

accommodate ourselves in the early stages of our career. If the intelligent onboarding assistant is a chatbot that provides only single, mechanical answers, it will significantly impact the employee's onboarding experience. Therefore, it is crucial for the assistant to have an anthropomorphic and emotionally expressive personality. Currently, emotion recognition and response techniques have been employed to enhance interactions between robots and human users, enabling robots to better understand and respond to human emotions, thus improving social adaptability and user satisfaction (Assuncao et al., 2022; Aylett et al., 2020). By simulating human emotional responses, researchers have incorporated emotions into reinforcement learning algorithms, improving learning efficiency and allowing AI systems to adjust their behaviors based on emotional feedback. These advancements are good for OTTO to add emotion handling to its abilities.

Emotions also act like the key component that regulates cognitive functions for learning and memory. Emotion recognition technology can act as a key for a more personalized and considered service of employee's emotions. For instance, it can be the right person to talk to when an employee is in a worried or reflective mood. Aside from just minimizing stress and anxiety among employees, this also ramps up their self-confidence and sense of belonging. Next, in case employees encounter tiredness and boredom, the assistant is allowed to cut down the learning pressure and then restructure the training programs, therefore, improving the training efficiency. The area of social and emotional AI has now become much more mature, with a lot of potential for improving human-computer interactions and exploring applications in areas like healthcare, customer service, and public interaction (Perepelkina & Vinciarelli, 2019). A research conducted through completion of questions in 378 participants via snowball convenience sampling by the means of social media advertising came up with interesting results, which revealed that the use of explainable artificial intelligence (XAI) made the users generally experience positive emotions such as pleasantness, confidence, trust, security, surprise, satisfaction, amazement, and interest (Bernardo & Seva, 2022), implying the positive impact.

5.3.2 NLP

NLP technology is an essential factor in creating onboarding artificial assistants that is not only capable of interpreting and creating human language but also conversing with new

employees in a more advanced and friendly manner. Through the use of NLP technology, the intelligent onboarding assistant can read the questions of the employee, understand the context, and give answers or suggestions accordingly. Typically, this technology is implemented through a chatbot—a program used to simulate a conversation with a human being, usually acting as a virtual assistant or interactive agent in a conversational interface. NLP is a common approach to ML for designing chatbot processes. NLP operates based on a corpus, while reality will be based on user input. There are also several cases where chatbots have been used in LMS, customer service, and other service industries (Kesarwani et al., 2023).

In practice, NLP enables intelligent onboarding assistants to go beyond answering standard queries to handling complex conversations and providing decision support. For instance, for common questions from new employees, such as benefits policies and work processes, intelligent assistants can instantly provide detailed answers and direct employees to access more in-depth resources. Additionally, for operations that require specific actions such as applying for vacation or reimbursement, intelligent assistants can guide employees through the entire process, reducing manual intervention.

By integrating NLP, the intelligent onboarding assistant provides not only an information query service but also a comprehensive employee support tool to help new employees quickly integrate into the organizational culture and enhance their productivity and satisfaction. The application of this technology significantly improves the efficiency of the HR department while optimizing the onboarding experience and long-term career development of employees.

5.3.3 Intelligence

The most critical aspect of AI assistants is their intelligence. This capability means that employees can completely disengage from the need for a trainer and fully benefit from their training experience through AI alone. Until now, in training or self-study without human involvement, employees had to seek answers to their questions from the internet. Most of these were very broad or of low quality, which made self-study inefficient in some ways. However, the problem-solving ability of AI assistants has been significantly enhanced with

the emergence of ChatGPT. Advanced AI technologies such as ChatGPT can dramatically improve the efficiency and quality of self-study by understanding complex contexts and the specific needs of the user and providing precise, professional answers. Moreover, it facilitates personalized problem-solving. Users are liberated from one-time questions and answers and can instead interact with the AI step-by-step in a conversational manner to enable it to generate the most reasonable responses. Currently, the potential of AI in solving complex problems extends beyond mere computational power to enhancing human decision-making, teamwork, and emotional interactions during problem-solving (Joksimovic et al., 2023).

Furthermore, AI is now capable of speech recognition and engaging in conversational interactions through synthesized voices, significantly enhancing its interactivity and user-friendliness. In doing so, AI moves beyond traditional manual text input, enabling voice-based communication with users. This more humanized approach has the potential to enhance staff productivity in various ways.

While ChatGPT may have reached or even surpassed the average coach in problem-solving abilities, communication through text alone is not sufficient for it to fully replace a human coach (Joksimovic et al., 2023). Also, AI has become more sophisticated with regard to image and video recognition capabilities. It can be programmed now to make these basic recognitions; for instance, facial or expression detection. Nevertheless, AI still has a problem with the more complex information, which can be seen in the tasks that need a high degree of professional judgment and creativity. For example, training such designers or front-end engineers could cover activities that AI is still unable to perform well such as assessment and guiding the visual design of websites and posters. This is why current AI image analysis is limited to simpler tasks such as categorization, emoji recognition, and text recognition in images, while a more advanced technology is required for more complex analyses. Hence, there is a need for enhanced AI intelligence, which also includes the capability to process and interpret multimodal inputs like audio, video, and sensor data, enabling a deeper understanding of and response to the human user needs.

5.4 Implement Intelligent Onboarding Assistant to Microsoft Teams

Most organizations and educational entities keep relying on Microsoft Teams, Microsoft's team collaboration tool, for their online meetings, collaborations, and lectures. OTTO can schedule the training sessions in an online format via Teams. Moreover, the network of Teams is very powerful and allows employees to interact more often with their trainers.

Particularly, the Teams app store is able to integrate a wide range of already available applications that comprise various tools, such as task management, learning management, and productivity improvement tools. Through the use of these apps, OTTO can perform a wider range of tasks and expand its function on the Teams platform, thus enhancing the efficiency of work and learning processes.

The Microsoft Teams bot framework adds the final touch in the deployment of OTTO. Utilizing the Bot Framework SDK (*Bot Framework SDK documentation—Bot Service*, 2024), OTTO can function as an intelligent assistant, facilitating natural interactions with users and offering a variety of customized services and functions. Azure also provides a cloud computing service for bots, enabling users to integrate their custom chatbots into the platform and develop the bot's logic, including processing user inputs and generating response messages. This capability allows for the debugging and testing of OTTO in Azure, reducing the resource consumption on the OTTO cloud. Subsequently, the application can be published to the Teams app store.

The official Microsoft Teams documentation (*Overview—Publish your app to the Microsoft Teams Store—Teams*, 2023) provides a general overview of the app publishing process. Initially, users must adhere to stringent pre-submission requirements to ensure compliance with the Teams app store standards. Subsequently, they are required to create a partner center developer account and prepare the necessary tests and instructions for submission. Once the app is submitted, it undergoes thorough testing for functionality and user experience; if any issues arise, the user will receive a validation report and must address these issues before resubmitting. Upon approval and publication, users can monitor app usage and enhance the app's visibility and effectiveness by optimizing search strategies and participating in training modules. Consequently, OTTO must closely follow these guidelines for its release.

6 Conclusions and Future Research

In this paper, I focus on the current research related to onboarding training, and initially measure some of the onboarding training platforms that currently exist, and finally simulate a feasible implementation after exploring various aspects of related technologies. The training materials are obtained through TalentLMS API, the intelligent training assistant is built through LLM, and finally it is integrated into Microsoft Teams. Although this is just a simple idea, I believe in its feasibility. Through multi-platform cooperation, OTTO is able to use the powerful functions provided by these platforms and give users a good experience through them.

Through relevant research, I have come to understand that traditional onboarding methods often fail to meet the constantly changing needs of organizations and employees. And there are problems such as difficulty in remote work, non-standard training processes, and poor training effectiveness. At the same time, I also understand the benefits of standardized and effective onboarding training for employees and the company. And some cases of integrating AI into the onboarding process. This has provided me with great confidence in implementing OTTO. Afterwards. I compared several mainstream onboarding platforms again, identified their strengths, and decided to apply them to OTTO. In the research methodology section, I extensively collected data on the current training situation and user needs through questionnaires. And use this information to further improve the functionality of OTTO.

In the implementation section, I referred to previous research and simulated a method for implementing OTTO. By using the Talent API. The company can better manage employees and courses, and keep track of the completion status of courses at all times. By researching and utilizing the latest AI technologies, OTTO can better assist employees in their onboarding process. Finally, by integrating into Teams, OTTO can better integrate into the daily work of employees. And provide suggestions for the work of employees at any time.

As a result of this research, I believe that OTTO should focus on providing a personalized, efficient and user-centric experience. The current onboarding platforms already have better training features. OTTO needs to explore and realize the potential needs of users who have not yet been realized while implementing the basic features. In the future, I will continue to

research about how to improve the intelligence of OTTO. This includes searching and learning about the latest research in NLP, LLM, ML, etc. And exploring the possibility of applying it to OTTO.

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Appendices

Appendix A: Questionnaire

Survey on Intelligent Onboarding Assistants

Mandatory questions are marked with a star (*)

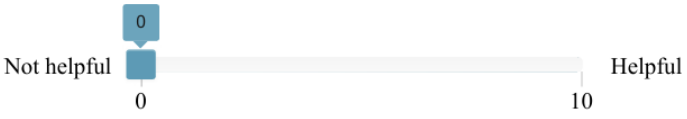
In today's society, onboarding is an essential step for employees to enter a company, and it is intended to enable them to quickly understand the company culture and work content so that they can work as soon as possible. We wanted to develop an intelligent onboarding assistant that could train employees like a real-life coach, reducing human involvement and providing personalized guidance and support. For this purpose, we would like to collect user requirements through this questionnaire.

1. Did you get trained when you onboarding? *

- ◯ Yes
- ◯ No

2. How would you rate the onboarding experience? *

3. How would you rate the training you received in terms of helping you with your daily tasks? *



4. What do you think are the current problems with training coaches? *

- ◯ Coaches are not professional enough
- ◯ Cannot get enough attention
- ◯ Disconnect between course content and actual needs
- ◯ Single training method
- ◯ Lack of independent learning
- ◯ other

5. Does your company already use some platforms to help train employees? If yes, what is the name of the platform? *

- ◯ Yes _____
- ◯ No

6. How often you use AI tools to solve problems at work or in training? *

- ◯ Very often
- ◯ Often
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

7. In what areas would you like more training? *

- ◯ Company Culture and Policies
- ◯ Technical Ability
- ◯ Teamwork ability
- ◯ Degree of workplace adaptation
- ◯ Others _____

8. What are the challenges of your current training methodology? *

- ◯ Time constraints
- ◯ Relevance to the job
- ◯ Quality of content
- ◯ Accessibility of resources
- ◯ Other

9. What training ways you are most interested in? *

- ◯ Video Tutorials
- ◯ Documentation and manuals
- ◯ One-on-one coaching
- ◯ Group discussions
- ◯ Hands-on exercises
- ◯ Others

10. Your suggestions for our intelligent onboarding assistants: *

Appendix B: Survey Report

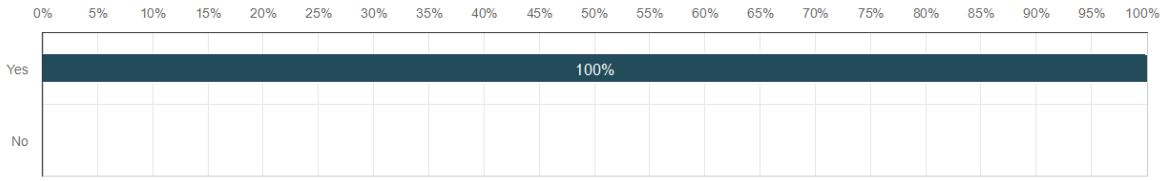
Basic report

Survey on Intelligent Onboarding Assistants

Total number of respondents: 11

Did you get trained when you onboarding ?

Number of respondents: 11



	n	Percent
Yes	11	100,0%
No	0	0,0%

How would you rate the onboarding experience?

Number of respondents: 11

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	7,0	5,8	6,0	64,0	1,8

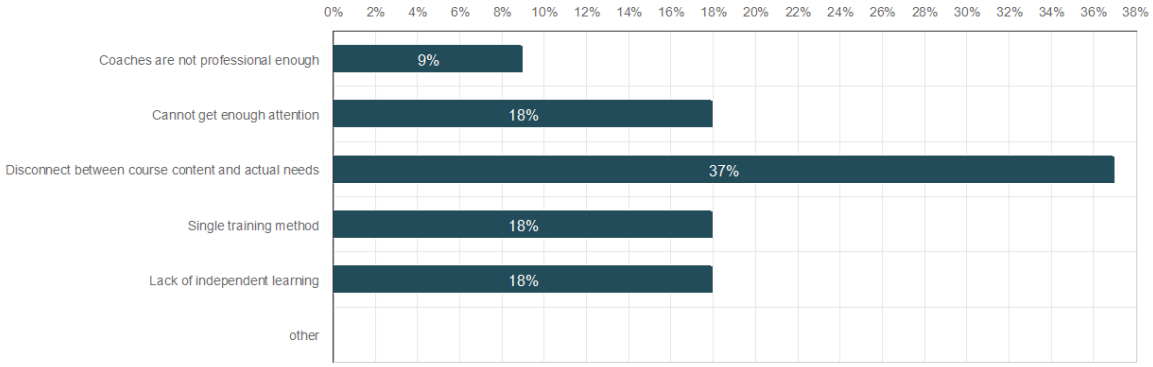
How would you rate the training you received in terms of helping you with your daily tasks?

Number of respondents: 11

Min value	Max value	Average	Median	Sum	Standard Deviation
1,0	8,0	6,2	6,0	68,0	2,0

What do you think are the current problems with training coaches?

Number of respondents: 11



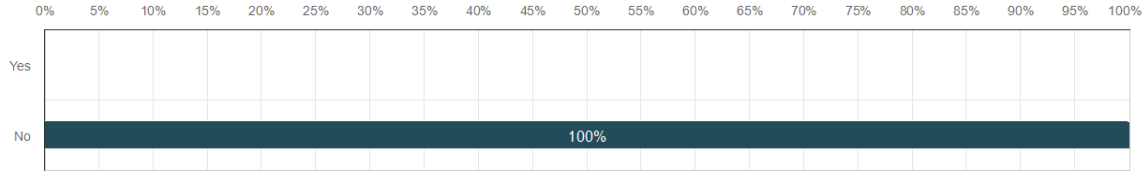
	n	Percent
Coaches are not professional enough	1	9,1%
Cannot get enough attention	2	18,2%
Disconnect between course content and actual needs	4	36,3%
Single training method	2	18,2%
Lack of independent learning	2	18,2%
other	0	0,0%

Answers given into textfield

Option names	Text

Does your company already use some platforms to help train employees? If yes, what is the name of the platform?

Number of respondents: 11



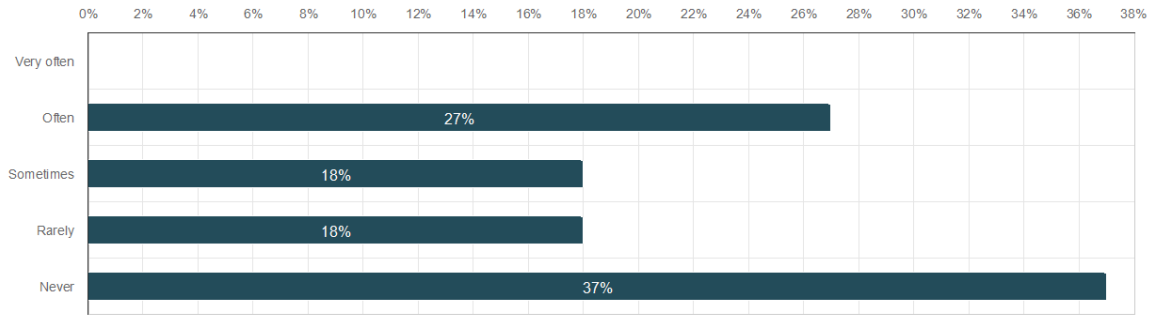
	n	Percent
Yes	0	0,0%
No	11	100,0%

Answers given into textfield

Option names	Text

How often you use AI tools to solve problems at work or in training?

Number of respondents: 11

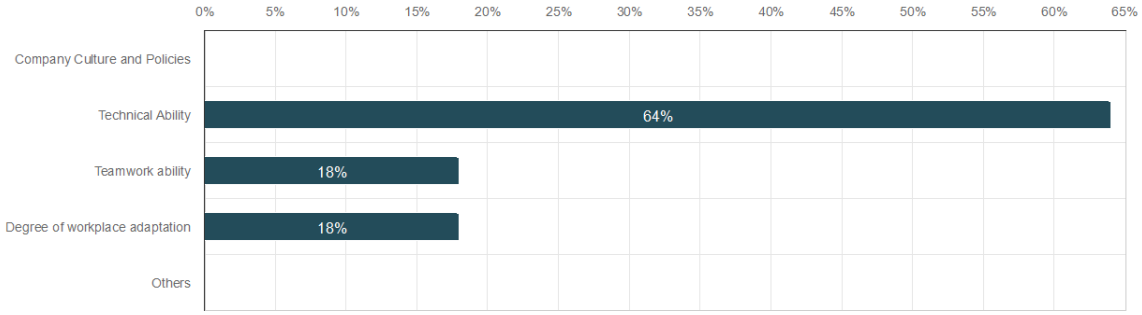


	n	Percent
Very often	0	0,0%

Often	3	27,3%
Sometimes	2	18,2%
Rarely	2	18,2%
Never	4	36,3%

In what areas would you like more training?

Number of respondents: 11



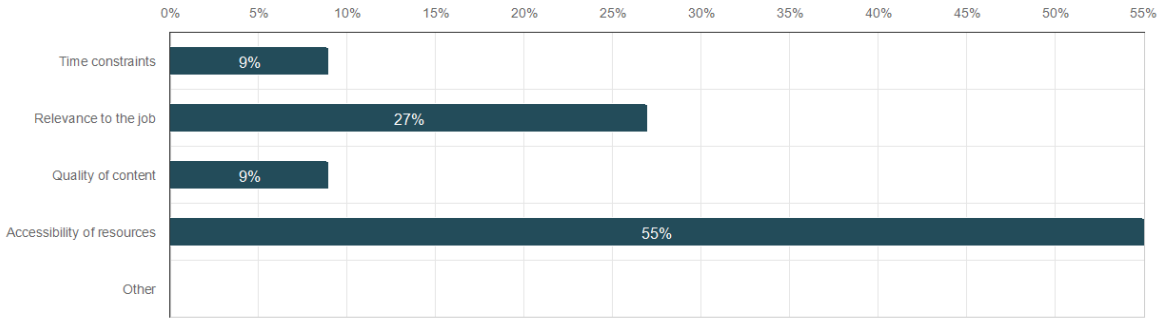
	n	Percent
Company Culture and Policies	0	0,0%
Technical Ability	7	63,6%
Teamwork ability	2	18,2%
Degree of workplace adaptation	2	18,2%
Others	0	0,0%

Answers given into textfield

Option names	Text

What are the challenges of your current training methodology?

Number of respondents: 11



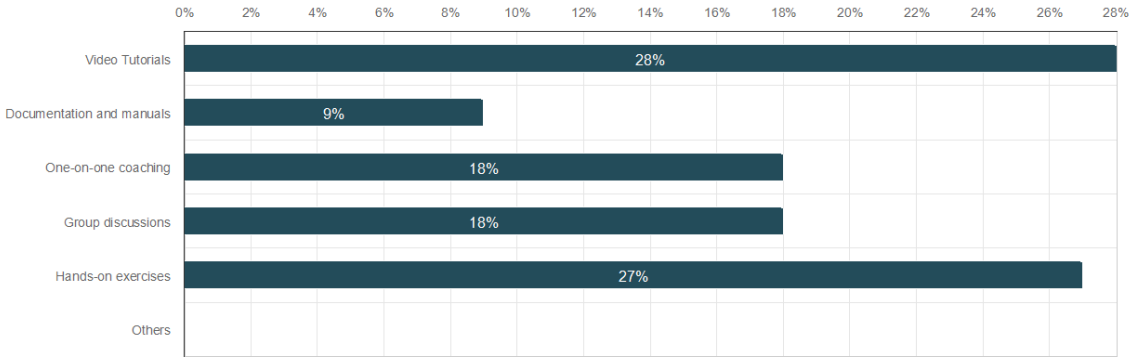
	n	Percent
Time constraints	1	9,1%
Relevance to the job	3	27,3%
Quality of content	1	9,1%
Accessibility of resources	6	54,5%
Other	0	0,0%

Answers given into textfield

Option names	Text

What training ways you are most interested in?

Number of respondents: 11



	n	Percent
Video Tutorials	3	27,2%
Documentation and manuals	1	9,1%
One-on-one coaching	2	18,2%
Group discussions	2	18,2%
Hands-on exercises	3	27,3%
Others	0	0,0%

Answers given into textfield

Option names	Text

Your suggestions for our intelligent onboarding assistants:

Number of respondents: 11

Responses
none
It should be available for accessibility and also provide personalized onboarding guidance.
Try to share more personal opinions
I think video tutorials are feasible for everyone
Frequent in-person interactions combined with online course material, and frequent feedback methods.
Start using more AI tools
Keep it simple so that even a layman can learn!
Not sure
place greater emphasis on hands-on exercises and activities

input necessary
NA