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AidMax - Chatbot Integration to Fight Teen Depression in Instagram

submitted by

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Contents

Abstract

Teenagers today face increasing rates of depression and suicide, often compounded by social stigma and limited access to professional mental health care. This thesis therefore explores the integration of a custom AI chatbot, called AidMax, into Instagram as a way to support adolescents aged from 15 to 25 and dealing with depression or suicidal thoughts. Building on established therapeutic approaches, like Cognitive Behavioral Therapy (CBT), Dialectical Behavior Therapy (DBT) and Behavioral Activation (BA), AidMax aims to offer prompt guidance through a platform that teenagers use regularly.

A mixed-method research design was employed. In the qualitative phase, expert interviews with psychologists, psychiatrists and crisis intervention specialists were conducted to identify features for effective AI-based mental health support. Their feedback revealed the chatbot's strengths in providing immediate help, directing at-risk individuals to crisis hotlines and offering encouraging strategies. However experts also highlighted the need for improvements in recognizing nuanced emotional cues such as sarcasm which are key challenges in AI-driven language interpretation. In the quantitative phase, a survey on the AidMax website gathered user feedback. Results showed moderate symptom alleviation and a willingness to recommend the chatbot to peers.

Overall the findings indicate that integrating an AI chatbot on social media can lower barriers to help-seeking, providing brief and meaningful support for struggling adolescents. While AidMax should not replace professional therapy for severe cases, it may be an early intervention tool. Future research should focus on refining Natural Language Processing (NLP) for subtle emotional expressions, strengthening user engagement over time and expanding referral mechanisms to ensure at-risk teens receive specialized care.

This work lays the foundation for integrating AI technology into social platforms. This offers a novel approach to support the mental health of adolescents and mitigate risks associated with depression.

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I extend my heartfelt thanks to the experts who participated in this study. Sabine Aicher, a crisis intervention expert, whose insights ensured AidMax provides immediate, empathetic support and accessibility features like voice messaging. Prof. Dr. Mark Menzel highlighted the need for refining AidMax's linguistic adaptability for younger users. Tanya Krämer, with her expertise in clinical and online psychology, highlighted the chatbot's potential as an entry point for young people, suggesting strategies to break social isolation and encourage structured daily activities. Prof. Dr. Christine Daiminger stressed the importance of gender-inclusive language, ensuring the chatbot caters to diverse audiences. Katharina Unger, with expertise in youth mental health, emphasized the importance of using psycho-educational imagery and metaphors to help users understand their emotions. Manuel Stoiber highlighted actionable, solution-oriented approaches to improve daily routines for users. Prof. Dr. Christian Janßen emphasized improving the chatbot's emotional depth and the importance of timely crisis interventions. I would also like to extend my gratitude to the participants who shared their perspectives and experiences during the quantitative phases of this research. Your input has been central to the relevance and impact of this study.

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Lastly this thesis is dedicated to the memory of Melissa Fürsich, whose story served as a reminder of the importance of accessible mental health support. May this work contribute to making a positive difference in the lives of those who need it most.

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List of Abbreviations

AI Artificial Intelligence
API Application Programming Interface
BA Behavioral Activation
BLEU Bilingual Evaluation Understudy
CBT Cognitive Behavioral Therapy
DROP Discrete Reasoning Over Paragraphs
DBT Dialectical Behavior Therapy
FFT Family Focused Therapy
GPQA General Purpose Question Answering
GPT Generative Pre-trained Transformer
NLP Natural Language Processing
ML Machine Learning
MGSM Multilingual Grade School Math
MMLU Massive Multitask Language Understanding
RLHF Reinforcement Learning from Human Feedback
SER Speech Emotion Recognition
VR Virtual Reality

1 Introduction

1.1 Motivation

Mental health disorders are nowadays an increasing issue among adolescents in every part of the world. According to recent statistics, more than one in eight teens suffers from mental problems, which may cause suicidal ideation [Atr+23]. Teen depression is also a big problem in Germany regarding the government[1], with suicide being the leading cause of death among individuals aged 15 to 25. The massive use of social media platforms like Instagram among this age group presents both challenges and opportunities for mental health interventions regarding Statista[2]. Because they can be accessed easily in their daily used network and the advent of AI chatbots, shows a promising avenue to address their issues. In this regard, this thesis will be about the integration of an AI chatbot into the social media platform Instagram and on the website aidmax.org[3], as an intervention strategy that would contribute toward mitigating teen depression and preventing suicides.

Two motivations justify this study. First it is driven on a personal level by the tragedy of a friend's daughter who took her life just 3 days before attending her first appointment of therapy. This urges the need to make immediate access to mental health support available for everyone. Second AI has an unparalleled potential to provide accessible and affordable mental health support. So instant assistance for distressed persons is possible with AI chatbots using NLP and Machine Learning (ML) [Bal23]. While technology might have advanced digital mental health solutions, gaps persist due to some common barriers. Novel chatbots like Woebot, Tess and Replika support people with mental problems. Such chatbots also resolve issues like supply shortages among mental health professionals, the cost of therapies and the stigma associated with seeking help. They offer advantages like anonymity, personalization and consistent support [SS23]. On the other hand, chatbots have challenges in lacking the emotional skills of human therapists. The literature has mentioned some limitations of existing AI chatbots to understand persons dealing with depression [Hua22]. Therefore this study will also research if chatbots can detect sarcasm, humor and cultural nuances all of which are relevant for successful mental health interventions. Besides ethical implications and an unresolved legal basis of AI use in mental health remain open to exploration and call for responsible regulation [Bal23].

Nevertheless AI chatbots have shown promise for a variety of applications, including the delivery of psychological support through CBT [Oma+23]. Yet there is less evidence of research that focuses on the impact of suicide reduction among teenagers on social media. This

[1] 19.12.2024 `https://www.bpb.de/kurz-knapp/zahlen-und-fakten/soziale-situation-in-deutschland/61832/todesursachen/`

[2] 19.12.2024 `https://www.statista.com/statistics/1337402/instagram-daily-use-by-age-germany/`

[3] 19.12.2024 `https://aidmax.org`

thesis will fill this gap in knowledge through the investigation of how teenagers interact with AI chatbots on Instagram, the limitations of current AI models in interpreting their language and the potential for AI chatbots to serve as tools against suicide. The previous research was focused on different aspects of AI chatbots in Mental Health. For example the chatbot of Pankaj Atram makes use of NLP through which the user gets positive reinforcement and advice resulting in reduced depression. However the study is related to web-based interactions, lacking insight about social media integration and its dynamics [Atr+23].

Another contribution is the work of Christine Grové, who designed a well-being chatbot with young people and expert stakeholders. The participatory design assisted in making the chatbot suited to the needs of its intended audience [Gro21]. Still the study did not examine how this chatbot worked on suicidal ideation or how it could be integrated into social media platforms. The features of AI have also been supported by the work of Xinrui Ren in 2020. In Virtual Reality (VR) games AI environments showed a reduction in anxiety and depression levels. Although VR opens a new horizon of engagement, its accessibility and practical usage among teenagers are questionable [Ren20].

AI chatbots can advance mental health care. However factors influencing adoption and continued use remain poorly understood in teenagers. Key influences of both in the context of depression and anxiety were identified in a study among 393 US adults [LPR23]. It found that performance in expectations, perceived value, social norms and psychological distress increased the adoption. On the other hand AI hesitancy and perceived effort decreased the likelihood of adoption [LPR23]. When integrating ChatGPT into Instagram to combat teen depression, it is essential to ensure the chatbot is seen as valuable, easy to use and beneficial. That's why it is called AidMax because it aids at the maximum possible level and virtually hugs the user to give the feeling of comfort and being valued. Also addressing privacy concerns and AI hesitancy will help maximize its adoption and effectiveness. Therefore the user can chat anonymously on the website and also read there in detail how his data is secured.

Therefore the integration of AI chatbots into social media platforms seems promising. As mentioned before social media is engraved in everyday life for teenagers, so it is easier for mental health treatments to occur naturally. Utilizing Instagram AI chatbots can engage in conversations with users offering support and referring those at risk to professional help when appropriate. Various other studies have shown that AI chatbots reduce the symptoms of depression and anxiety effectively through mechanisms that include CBT and BA techniques. For instance, the chatbot Tess was able to show meaningful help and reduce stress among college students [Ful+18].

This study is an attempt to add to these findings and to extend the discovery of dynamics that characterize social media interactions. The integration of an AI chatbot into Instagram offers a new way of approaching the mental health crises of teenagers. As mentioned above such chatbots can provide immediate, accessible and affordable support that could decrease symptoms of depression and prevent suicides. However there are many research gaps, especially in subtle understanding and suicidal ideation. This thesis attempts to fill those gaps through comprehensive qualitative and quantitative research. Thereby contributing to better development of digital mental health interventions.

1.2 Research Questions

These research questions are meant to guide the thesis in investigating the effectiveness, engagement and limitations of AidMax in addressing teen depression on Instagram. The primary research questions are as follows:

1. How do individuals within the 15-25 age group engage with a mental health support AI chatbot on Instagram?

   This question seeks to ascertain the frequency, duration and quality of the interactions. It also questions the nature of the concerns tackled and the responsiveness by users to guidance provided by AidMax. The research will find out how the age group uses the chatbot to shed light on how AI can be used to provide support for young people's mental health on social media platforms. It will seek to provide a balanced examination of data gained that looks at both the benefits and challenges of including AI chatbots in social media.

2. What are the limitations of current AI models in interpreting and responding to the language used by depressed users on social media?

   This question examines the limitations of current models, concerning suitable understandings and responses of NLP systems. Also the linguistic expressions by their users in social media communications among people who suffer from depression will be analyzed. It attempts to expose the lacuna in the current technology in detecting sarcasm, cultural and linguistic diversity.

3. To what extent does an AI chatbot intervention reduce the risk of suicidal ideation among young social media users?

   This question assesses the efficacy of AidMax to act as either prevention or treatment in decreasing suicidal ideation and depressive thoughts. The study will question the users about how they feel about AidMax and if their mood has improved after chatting with him. It also examines the capability of AidMax to refer at-risk users to professional help.

By addressing these research questions, the thesis aims to provide a comprehensive understanding of the potential and limitations of AI chatbots in supporting mental health among teenagers on social media platforms.

1.3 Structure of the Thesis

The structure of this thesis is designed to address the research questions and provide an analysis of the integration of AidMax into Instagram for mental health support. The thesis is organized as follows:

1. Introduction

   The current chapter introduces the problem of teen depression and the potential of AidMax to provide mental health support. It outlines the motivation for the research, identifies the research gap and presents the research questions guiding the study.

2. Background

   This chapter informs about psychological treatments, the upcoming of AI chatbots in the area of digital treatments and their applications within different settings. It theoretically positions the role of AI in support of mental health and outlines the main findings and limitations of past research.

3. Methods

   The chapter explains the integration of ChatGPT into Instagram and the modifications required for effective implementation. It also describes the research design and methodology employed in the study.

4. Results

   This chapter presents the results of the qualitative expert interviews, their analysis through Mayring's technique and the quantitative research results of the survey.

5. Discussion

   The chapter explains the findings from the data analysis and it also interprets the results in the context of the research questions.

6. Conclusion

   The final chapter summarizes the study's contributions, limitations and future work. It discusses the implications of the research for future AI-driven mental health interventions and suggests directions for further research.

This structured approach ensures a comprehensive exploration of the research questions, providing insights into the potential of AI chatbots to support mental health among teenagers.

2 Background

This chapter introduces the theoretical background and lays the base regarding how AI chatbots have been integrated into mental health interventions, specifically among teenage depression. The chapter shall bridge the psychological aspects of teen mental health and the technology behind AI chatbots. Thereby equipping the reader with the knowledge to understand the research questions in this thesis.

A systematic literature review was conducted to gain knowledge on the topic. A structured approach tailored to align with the theoretical framework and objectives of this thesis was used. The process was grounded in evidence-based methodologies to ensure comprehensive and credible coverage of the topic [Bro+09].

The process began with a description of the research questions and thematic boundaries central to the study. The focus was on adolescent mental health, AI chatbots and their integration into digital interventions via social media. This stage clarified the scope of inquiry, ensuring the literature search remained aligned with the research objectives.

Based on the framework, a comprehensive search strategy was formulated to locate relevant sources across disciplines. Specific keywords and phrases were derived from the research themes, like "adolescent depression", "AI chatbots", "CBT for youth", "digital interventions", "suicidal ideation detection" and "social media-based mental health support". Boolean operators were applied to create search strings that combined these terms. For instance: ("Adolescent depression" OR "Teen mental health") AND ("AI chatbot" OR "Digital mental health intervention")

Guided by the described technique, key databases and repositories were selected for their relevance to the multidisciplinary nature of the research. Medical databases like PubMed[1], Springer[2] and MEDLINE[3] for studies on mental health. Computer science sources like IEEE Xplore[4] and ACM Digital Library[5] for research on AI chatbot technology. Also general academic repositories like Statista[6], Scopus[7] and Google Scholar[8] to cover interdisciplinary studies.

[1] 19.12.2024 `https://pubmed.ncbi.nlm.nih.gov/`
[2] 19.12.2024 `https://link.springer.com`
[3] 19.12.2024 `https://search.nlm.nih.gov/`
[4] 19.12.2024 `https://ieeexplore.ieee.org/`
[5] 19.12.2024 `https://dl.acm.org/`
[6] 19.12.2024 `https://de.statista.com/`
[7] 19.12.2024 `https://www.scopus.com/`
[8] 19.12.2024 `https://scholar.google.com/`

The technique emphasized the importance of setting criteria for selecting studies. Inclusion criteria were established to focus on peer-reviewed articles, reputable conference proceedings and studies published within the last decade to ensure contemporary relevance unless foundational works were necessary. Also research directly addressing adolescent mental health or AI chatbot applications in this context was included.

The exclusion criteria filtered irrelevant studies and articles with insufficient methodological detail, out of the thesis.

Utilizing systematic screening protocols, abstracts and titles were initially reviewed to determine relevance. Studies passing this stage underwent full-text analysis to confirm alignment with the research questions. This step was performed iteratively, ensuring comprehensive coverage without introducing redundancy.

Once studies were identified, data extraction was performed using templates. Key elements included study objectives, methodologies, findings and implications. Extracted data was categorized into thematic areas such as the psychological of adolescent mental health, technical aspects of AI chatbots and integration of interventions into social media platforms. The coding process ensured the literature was organized systematically to highlight patterns and gaps within each theme.

An appraisal of the selected studies was conducted to evaluate their methodological robustness and relevance to the research focus. The findings were synthesized into coherent narratives that bridged psychological frameworks, technological capabilities and social media integration. For instance, studies on CBT and DBT were contextualized to show how their principles could be adapted for AI-driven interventions. Also research on NLP's role in detecting emotional cues was synthesized with discussions on its limitations in understanding nuanced expressions.

Attention was paid to areas where the literature was sparse. Gaps were identified, such as the limited focus on suicide prevention within chatbot studies, ethical considerations for data security and challenges in sustaining user engagement on social media platforms. These gaps were explicitly tied to the thesis's research questions.

Findings were re-evaluated against new literature to ensure comprehensive coverage and consistency. Cross-validation with foundational studies helped anchor the research in established theoretical and empirical bases.

Finally the documentation of sources in this thesis and citation management ensured transparency and replicability. TeXworks was used to organize citations systematically.

By following this detailed approach, the literature review not only established a theoretical foundation but also addressed the interdisciplinary nature of the research. Each step ensured that selected studies were relevant, reliable and integral to help the reader understand the research questions.

2.1 Psychological Context

Depression in adolescents is associated with feelings of hopelessness, low self-esteem and social withdrawal [Pan+17]. Other symptoms include changes in sleep patterns, appetite, energy levels and concentration. Individuals also experience physical symptoms such as headaches,

digestive problems and body aches that cannot be explained by other medical conditions [FK10].

Suicidal ideation or planning of suicide, is alarmingly common among depressed teenagers. A variety of risk factors have been noted to predispose people towards suicidal ideation. These include depression and anxiety disorder, a family history of psychiatric illness, substance abuse and the experience of bullying [Kim+15]. Other risk factors are social isolation, a feeling of not being cared for and experiences of physical maltreatment [Pan+17].

Most adolescents with depression have difficulty regulating negative thoughts and emotions. This increases feelings of hopelessness and despair [Ord+18]. Other findings point to changes in brain network dysregulation, associated with higher levels of suicidal ideation [Ho+20].

Therefore it is important to treat patients as soon as possible. CBT is among the strongest interventions that work in adolescents [DBL16]. It is a technique that addresses unhelpful thinking and behavior patterns. CBT is a time-constrained and goal-oriented form of remedy. It has been appreciably studied and carried out in treating numerous intellectual health disorders. The concept is that negative thoughts, feelings and behaviors are interconnected. Converting unhelpful cognitions, individuals can alleviate emotional distress and enhance their well-being [MW17]. CBT also focuses on problem-solving and the acquisition of skills to handle problems in the future. For example, individuals who are either depressed or anxious learn to question negative thinking and replace those cognitions with more realistic thoughts [CF16].

CBT is also one of the most common usages for AI chatbots in mental health. Assisting users in recognizing and reconsidering negative thought patterns. AI chatbots offer services that allow improvement in mood and a reduction in symptoms of depression and anxiety, such as Woebot and Tess. Apart from CBT, chatbots have been developed to provide BA. A psychotherapeutic intervention that empowers the users to engage in a rewarding activity for improving their status of mental health. Such chatbots are capable of monitoring user behavior and reinforcing positive changes with personalized feedback and encouragement [Rat+22].

DBT, an adaptation of CBT, has appeared to be effective in reducing self-harm and suicidal ideation, especially when used together with Family Focused Therapy (FFT) [Kot+20]. DBT integrates the principles of CBT with mindfulness techniques, which have their basis in Zen philosophy. The treatment is based on holding a balance between acceptance and change. This teaches the patients to accept and control their emotions, tolerate distress and enhance relationships [Swa18]. The DBT program is organized around crucial modules of mindfulness, misery tolerance, emotion regulation and interpersonal effectiveness. These give the person the essential abilities to cope with an emotional disaster without self-harming behaviors. Mindfulness permits the patients to be present and non-judgmental. At the same time as stress tolerance makes them learn how to deal with pain and difficult feelings. Emotion regulation specializes in figuring out and decreasing emotional vulnerability. Interpersonal effectiveness makes relationships wholesome by putting forward needs and boundaries [Fei08].

FFT has also been found to be beneficial for adolescents with a history of suicide attempts or self-harm. This therapy helps to improve family communication and reduces conflicts [Esp+19]. A case observe specializing in FFT found that digital delivery of the therapy

during the COVID-19 pandemic helped lessen signs and symptoms of depression, anxiety and anger in kids while additionally enhancing relationships [SBB23].

The psychological context of depression and suicidal ideation among adolescents is important for the development of effective interventions. Major risk factors contributing to suicidal ideation in adolescents include depression, social isolation and cognitive-emotional dysregulation. Interventions like CBT, BA, DBT and FFT show promise but a more accessible approach is needed and will reach at-risk adolescents. Therefore these psychological approaches will be included in the prompt of AidMax to make him assist as needed.

2.2 Functionality of AI Chatbots

The following section will outline the functionality of AI chatbots, their role in the delivery of mental health interventions and their limitations.

Fundamentally, chatbots are customary conversational agents powered by AI with the ability to simulate human-like dialog and provide responses based on user inputs. The critical technologies driving chatbots include NLP and ML. NLP allows chatbots to understand and generate human language, whereas ML allows improvements in responses over time through learning from user interactions [Jos23].

The core of NLP involves the ability of machines to read, understand and generate human language. It is an interdisciplinary field integrating many areas like computer science, linguistics and cognitive science [HM15].

Starting in the late 20th century, with the development of statistical models, NLP was being enhanced by ML. Statistical models such as Naive Bayes, Support Vector Machines and Hidden Markov Models are revolutionary for NLP, since the systems could learn on large datasets instead of relying on hand-coded rules. Therefore they could perform named entity recognition, part-of-speech tagging and syntactic parsing at high levels of precision [ZZ19].

In ML the orientation of algorithms can be either supervised, unsupervised or reinforcement learning. Supervised learning involves training algorithms on labeled datasets, where the input data is associated with the correct output. This is the approach when image classification needs to be accomplished, where the machines learn through images that have labels [JM15].

By contrast, unsupervised learning uses unlabeled data. The goal of this approach is to find hidden patterns within the data. In reinforcement learning an agent learns a strategy through interaction with its environment. This also sees wide application in robotics, gaming and autonomous vehicles, where the algorithm learns from trial and error [Kub15].

These models still maintained some limitations in the comprehension of context and semantics. The breakthrough in NLP came with a new stride in deep learning models. Those techniques enabled machines to handle and reproduce linguistic material better through learning from large datasets. One of the key innovations in this regard was the introduction of transformers, which facilitated handling sequential data and context in language processing. Transformers strongly enhanced the possibility of machines understanding contexts by processing full sentences or paragraphs and not word by word or token by token. This improved performance for a wide range of NLP tasks like machine translation, summarization and question answering [Jos77].

Thanks to this development, chatbots like Generative Pre-trained Transformer (GPT) can engage with users through text, voice or even visual inputs [SS23]. They can ask questions, listen to responses and guide users through interventions like CBT. Chatbots such as Woebot or Replika make use of preprogrammed sets of conversation pathways. They also use therapeutic models such as CBT to help users challenge cognitive distortions [SS23]. One major technological limitation relates to a chatbot's inability to display and show emotional intelligence comparable to human therapists. While they can mimic human speech, they might fall short of capturing human expressions, such as sarcasm, humor or emotional cues. Therefore chatbots should be utilized for conditions ranging from mild to moderate mental health disorders. Those conditions that could be more psychiatry-oriented and might best be treated by a human specialist.

Nevertheless AI-powered chatbots are promising in their abilities to make mental health more accessible. Especially to populations that can't get into human therapy because of costs, stigma or distance. Chatbots offer services 24/7 so they can help people when they need it, without waiting for an appointment with a therapist [Bal23]. Since the outbreak of COVID-19, mental health chatbots have emerged as a response to increased service needs. For example, Woebot provides exercises about crisis management, shown to be effective at reducing symptoms of anxiety and depression [Bou+21].

Tess is an AI chatbot that has been successfully used through short message service to deliver personalized mental health support, including cognitive and behavioral coaching. Adolescents who used Tess reported positive change which documented the potential of AI interventions [Ste+19].

The mentioned treatments could be embedded within everyday life by integrating chatbots on platforms teenagers already spend a significant amount of time on. The capability of the chatbot to monitor user engagement and alter its responses based on previous interactions would allow for personalized interaction that resonates with the needs of the user [LPR23].

Another important function of chatbots is psychoeducation. They provide users with information about mental health conditions, ways of coping and self-care techniques. The chatbots make it easier for users to access education and enable them to be more interested in their wellbeing [AS22]. Interventions mediated through AI chatbots may also be tailored to user inputs so that the advice is matched to user needs [Agg+23].

But while AI chatbots can be successful at mental health, their understanding of complex emotion and subtlety still has a long way to go. They may fall short in identifying sarcasm, humor and other cultural expressions that are an important part of communication and emotional support [DAH21]. This may result in inadequate responses, which could limit the efficiency of the chatbot.

Human therapists might mold their approach to better accommodate the needs of their patients through subtle understanding and empathy. The chatbot relies upon algorithms that cannot fully capture the depth of human emotions. This probably is why some users consider interaction with chatbots less helpful for them in complex issues of mental health [KB23].

While AI chatbots come with several advantages, they raise ethical issues regarding data privacy and security. Users entrust the chatbot with personal information about their minds, which brings into question the storage, usage and protection of this sensitive data. Privacy and

addressing user concerns over data breaches will be key features in the successful integration of AI chatbots into mental health care [Abd+20].

Overall AI chatbots represent a powerful tool that can make mental health care more available. They can deliver mental health interventions and psycho-education via NLP and ML. There are also persistent challenges to personalization, emotional intelligence and ethical considerations. Further development and research are needed to improve the capabilities of chatbots about those limitations.

2.3 Eligibility for Mental Support

Ensuring the safety of AI chatbots like GPT in responding to sensitive topics is a priority. Because the AI chatbot should only positively support the user. OpenAI for example has implemented measures to prevent these AI systems from providing harmful content, focusing on technical and ethical safeguards. These strategies highlight the commitment to creating tools that are not only advanced but also responsibly designed. OpenAI also partners with Amazon, Google and Meta to ensure child safety. They prevent by selecting non-harming data to train the AI with and protect by monitoring for attempts to produce harming content[9].

One of the approaches OpenAI uses is integrating safety filters into their systems. These filters are designed to detect and block unsafe responses. A study has shown that these mechanisms can reduce the likelihood of harmful outputs, with advanced filters achieving accuracy rates of 89 percent in identifying unsafe content. This was done with a test suite called SimpleSafetyTests, which demonstrated that combining filters with safety-focused prompt engineering greatly reduces the model's compliance with dangerous instructions [Vid+23] Additionally OpenAI continually evaluates and updates its models to improve their safety. Comparative research has shown that newer versions, such as GPT-4, perform better in aligning with professional assessments in areas like suicide risk evaluation [LE23].

Despite these advances, OpenAI recognizes that no system is entirely foolproof. As a result, they emphasize human oversight in the application of GPT models, particularly in sensitive areas like mental health. A key strategy involves training these models using Reinforcement Learning from Human Feedback (RLHF). This process fine-tunes the AI to refuse requests that promote illegal activities, self-harm or other dangerous behaviors. Notably GPT-4 is 82 percent less likely to respond to requests for disallowed content compared to its predecessor, GPT-3.5[10].

In addition to RLHF, OpenAI conducts safety evaluations before deploying new models. This includes empirical testing and red teaming[11], where experts identify and mitigate potential risks associated with the AI's behavior. For instance before GPT-4's release, over 70 external experts assessed its safety, leading to the implementation of interventions designed to reduce harmful outputs[12]. The integration of these AI tools is intended to complement, not replace, professional judgment. This collaborative approach ensures that the insights provided by GPT can enhance decision-making without compromising safety. For instance, in assessments of

[9] 20.12.2024 https://openai.com/safety/
[10] 20.12.2024 https://openai.com/index/our-approach-to-ai-safety/?utm_source=chatgpt.com
[11] 20.12.2024 https://openai.com/index/red-teaming-network/
[12] 20.12.2024 https://openai.com/index/openai-safety-update/?utm_source=chatgpt.com

suicide risk, GPT-4 has been shown to perform comparably to mental health experts and outperformed them in recognizing suicidal ideation [LE23].

Furthermore OpenAI has established a Safety and Security Committee with the authority to delay model releases if safety concerns are identified. This committee oversees safety evaluations and ensures that any potential risks are addressed before the AI systems are made publicly available[13].

Overall a multi-faceted approach to ensuring its chatbots do not contribute to harmful behavior has been established. By combining advanced safety filters, ongoing model evaluation and human oversight. The effectiveness and extensiveness of these safeguards address mental health responsibly.

2.4 Gaps in Existing Research

AI chatbots have demonstrated great potential for providing accessible and timely support for mental health. Yet several crucial gaps persist in the literature to date. Therefore this chapter discusses areas where more research is needed.

One literature gap is the limited research into how AI chatbots can fulfill their purpose of preventing or reducing suicidal ideation among adolescents. Chatbots like Woebot [FDV17] and Tess [Ful+18] are showing some impact in symptom improvement for depression and anxiety. However very few studies focus on the prevention of suicide. Most studies examine general mental health outcomes without differentiating between varying levels of risk or addressing needs particular to individuals with suicidal ideation [DAl+17].

The detection of suicidal ideation through text-based communication is challenging. Most chatbots today rely on either sentiment analysis or simple keyword detection that misses complex expressions of distress or suicidal intent [DW21]. Nevertheless every new deep learning model brings promise in the detection of suicidal tendencies through more complex language patterns. Because the accuracy of real-time detection in indirect expressions can make the difference between life and death.

While the contribution of social media platforms as a channel for providing mental health information is well-appreciated, the degree to which AI chatbots could be integrated into these platforms remains the subject of scarce study. Social media provides unique advantages, including high user engagement and accommodates the opportunity to reach adolescents in a setting with which they are already comfortable [Cha+19]. However this is where existing research has not yet examined how to optimize interactions with chatbots on Instagram, where the use may be different from dedicated mental health applications or websites.

Because these social media environments come with short attention spans and the general distraction inherent in such settings [Liu23]. Very little has been done in research on how AI chatbots can sustain a meaningful level of engagement among adolescents over some period in such fast-moving digital environments. Most of the research shows that despite how well they should stand in structured environments, the performance of chatbots remains untested in social networking sites [Abd+20].

[13] 20.12.2024 `https://openai.com/index/openai-board-forms-safety-and-security-committee/`

Another gap in research includes privacy concerns associated with AI chatbots as mental health interventions [AS22]. Adolescents are one of the most vulnerable groups in that respect and their interaction with mental health chatbots is always associated with the disclosure of sensitive personal information. The risks of data breaches and information misuse are serious concerns that past research failed to give proper consideration [Shi23].

With the present tendencies, AI chatbots are unable to understand and respond to complex human emotions. While the improvements in NLP and ML have enhanced the capability of chatbots to identify basic emotional states, they remain far from detecting subtle emotional cues, such as sarcasm, humor and cultural variabilities [BIS22]. This is important because teenagers make most of their statements in ways that can be difficult for any AI system to interpret accurately.

Most digital interventions report high attrition rates, with users commonly disengaging shortly after initial interactions [Wil+21]. Understanding which factors contribute to user retention will be crucial for ensuring these technologies can provide meaningful mental health support.

While AI chatbots have shown a lot of potential in aspects of digital mental health, the critical gaps in research need to be bridged to make them reach their full potential. This includes research in preventing suicidal ideation, improving emotional understanding, ensuring privacy integrity and fostering user retention. This will then help in developing AI chatbots as reliable, ethical and effective tools that can support adolescent mental health.

2.5 Theoretical Framework

This chapter provides the theoretical framework for the research questions of this thesis, about how AI chatbots operate within the context of mental health, their limitations and their potential in addressing psychological challenges on social media platforms.

NLP is the backbone of the functionality that enables AI chatbots to detect and respond to users in real-time. Therefore when users type in text, the NLP system should categorize both their emotional state and identify principal issues to offer appropriate interventions. AI chatbots are good at parsing distinct expressions of distress but fall short on more subtle hints like sarcasm, humor and cultural nuances [Zha+21]. A chatbot might, therefore, fail to grasp the emotional nuances included in a user's input, which is key to avoiding miscommunication in dealing with suicidal ideation [Abd+19].

The ability to identify and respond to emotions becomes critical in helping individuals who may express depression or suicidal thoughts. The theoretical gap underlies the research question: What are the limitations of current AI models in interpreting and responding to the language used by depressed users on social media? The main challenge remains to discover sophisticated NLP algorithms that concede more emotional subtlety.

As mentioned before ML algorithms make AI chatbots more adaptive through learning from user interactions. As the data collected by a chatbot grows, so does its perception of user behaviors and preferences. Such adaptability is important in keeping the chatbot effective for long-term use and relevant to personalized support.

One glaring weakness with existing chatbot models is that they can rarely respond appropriately to crises. While the chatbot might identify patterns that are indicative of depression, its possibility of interfering when a user is in a state of suicidal ideation is rather low [ZWP22].

This challenge directly relates to the research question: To what extent does an AI chatbot intervention reduce the risk of suicidal ideation among young social media users? Therefore AidMax will include real-time data analysis with dynamic response mechanisms that could trigger appropriate crisis interventions, including referrals to emergency services when needed.

Whereas integration into a platform like Instagram is important, the adoption and continued use are major concerns for the success of AI chatbots. Users are most likely to consider continuing the use of a chatbot if they find it easy to use and valuable, according to mentioned studies. This therefore gives rise to the research question: How do 15-25-year-old individuals engage with a mental health support AI chatbot on Instagram? The drivers of usage, such as personalization, emotional responsiveness and incorporating human elements are important.

The theoretical framework for AI chatbots in mental health interventions integrates principles from NLP and ML. It is, therefore, crucial to understand how these technologies interact with human psychology and mental health care to answer the research questions posed in this thesis. Then AI chatbots can be successful in the diagnosis and treatment of mental disorders among teenagers through social media platforms.

3 Methods

The methodologies selected in this chapter address the technical aspects of the integration, as well as research strategies for evaluating the thesis. The combination of qualitative and quantitative methods in this study provides insight into the interaction of adolescents with the chatbot and how these will influence their mental health outcomes.

3.1 Instagram

The following section outlines the justification for using Instagram as the platform. A study[1] done by ARD and ZDF, whose result is visible in this Figure 3.1 shows that Instagram is the most used social media platform by teens.

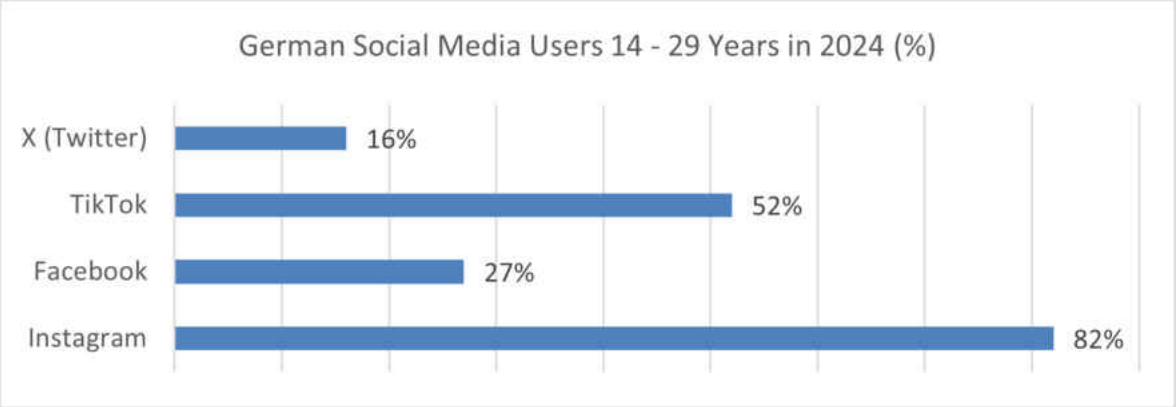

Figure 3.1: Share in percent of social media platform users from 14 until 29 years of age in Germany in 2024

Instagram engages on low levels and the space is less judgmental than daily life, so most of the stigma around mental issues is removed [JJZ23]. Teenagers also use Instagram to post experiences that involve personal struggles about their mental state. Therefore it is perfect for AidMax to deliver accessible support within a familiar setting. Research has documented that teenagers express feelings on platforms like Instagram rather than in face-to-face interactions. This also helps with providing mental health interventions [BIS22].

Instagram is already known to have a positive and a negative effect on mental health. On one hand utilization of social media has been linked to anxiety, depression and low self-esteem among adolescents because of comparisons and bullying [Ade+21]. On the other

[1] 31.12.2024 https://de.statista.com/statistik/daten/studie/543605/umfrage/verteilung-der-nutzer-von-social-media-plattformen-nach-altersgruppen-in-deutschland/

hand, Instagram has the potential to promote mental health care by stimulating peer support and sharing matching resources. Therefore organizations use Instagram to raise awareness, share methods of coping with problems and create communities for sharing feelings [Tho+20].

As mentioned before young people often find it difficult to access mental health services because of stigma, cost and lack of awareness [SM16]. Instagram helps people access mental health support without leaving their safe zones. AI chatbots like ChatGPT can give mental health advice and help in a place that feels safe. It was proven that ChatGPT-4 could even give mental health professionals advice since it outperformed them in recognizing suicidal ideation and psychache [LE23]. Digital mental health interventions work best when they meet users where they are [Zho+21].

Moreover the messaging system on Instagram is private and gives users a feeling of safety. This can decrease stigma in seeking mental health care and increase the likelihood of users talking to the chatbot. The informal style of Instagram messaging is the kind of low-pressure interaction important for mental health interventions [Leh+20]. Therefore Instagram is the best system for personalized mental health support through direct messaging. Communication immediacy allows for timely interventions among those currently experiencing a mental health crisis. Familiarity with the Instagram interface reduces the learning curve. The audience can interact with the chatbot more easily than with new and complicated tools.

Technical capabilities also make Instagram a suitable platform for hosting the AI chatbot. The messaging API of Instagram allows an efficient integration of automated communication tools such as ChatGPT. It enables the chatbot to handle volumes of messages and respond in real-time to its users. Furthermore Instagram allows not only text-based responses but also visual content, through this smileys and links can be shared by the chatbot. This makes the intervention multimedial and more relatable to the user [Gan+22].

Instagram's algorithm promotes interesting content. Therefore it allows the chatbot to help users who are searching for mental health support. Adolescents search for hashtags if they feel bad. Through them they can find the chatbot which maximizes the potential reach of the intervention [MG20].

The interactive nature and visual aspect of Instagram, furthered by widespread usage by young people themselves, mean ChatGPT will reach intended audiences in a timely and engaging manner. More importantly further destigmatization by Instagram creates a comfortable and familiar environment where private discussions supplement the effectiveness of mental health support.

3.2 ChatGPT

The decision to use ChatGPT as the chatbot for AidMax was not only based on its ML abilities but also its performance in audio translation, a feature that may enhance AidMax's ability to assist young adults. While AidMax's primary mode of communication is textual, integrating audio translation capabilities can significantly enhance accessibility, understanding and user engagement[2]. Therefore here will be explained why ChatGPT-4o, was chosen for AidMax, contemplating its Multi-step Reasoning through Multilingual Grade School Math (MGSM),

[2] 19.12.2024 `https://www.instagram.com/aihelpproject/`

Massive Multitask Language Understanding (MMLU), General Purpose Question Answering (GPQA), Discrete Reasoning Over Paragraphs (DROP) and Audio Translation Performance. Nevertheless as mentioned before ChatGPT-4 also performed better than psychological experts in detecting attempts of suicidal behavior, which makes the enhanced version 4o also fitting from a mental health point of view [LE23].

The choice for ChatGPT-4o as the model for AidMax is rooted in its superior capabilities in ML and to provide context-aware responses. ChatGPT-4o as part of the GPT family, seems promising at understanding nuanced human feelings and supplying appropriate interventions [LPR23]. The data for the comparison in the following graphs is from the website of OpenAI[3].

One of the main reasons for choosing ChatGPT-4o is its advanced NLP capabilities. It develops a deeper understanding of human text and can be more spontaneous during conversations, to adopt a natural approach in showing empathy. This aspect is important during mental health intervention, since users may share complicated emotions and thoughts that trouble them. Its capability of decoding linguistic expressions makes ChatGPT-4o particularly apt to interact with adolescents, who may use new ways of describing their emotional states [Jos23].

Therefore MGSM evaluates the model's capacity to observe and respond to conversations that involve multi-step reasoning [Shi+22]. This is critical for AidMax since mental health conversations regularly spread over numerous steps, requiring the chatbot to track the person's emotional state and adapt its responses. Complex issues like depression or suicidal ideation won't be communicated immediately, but discovered over time via subtle cues.

Claude 3 Opus leads this category with a 90.7 percent score in Figure 3.2, closely followed by GPT-4o at 90.5 percent and GPT-4T at 88.5 percent. While Claude plays slightly higher in multi-step reasoning, GPT-4o continues to be noticeably effective, making it prepared to deal with evolving mental health conversations where emotional nuance needs to be tracked over several exchanges. For AidMax multi-step reasoning is vital to detecting signs of suicidal ideation.

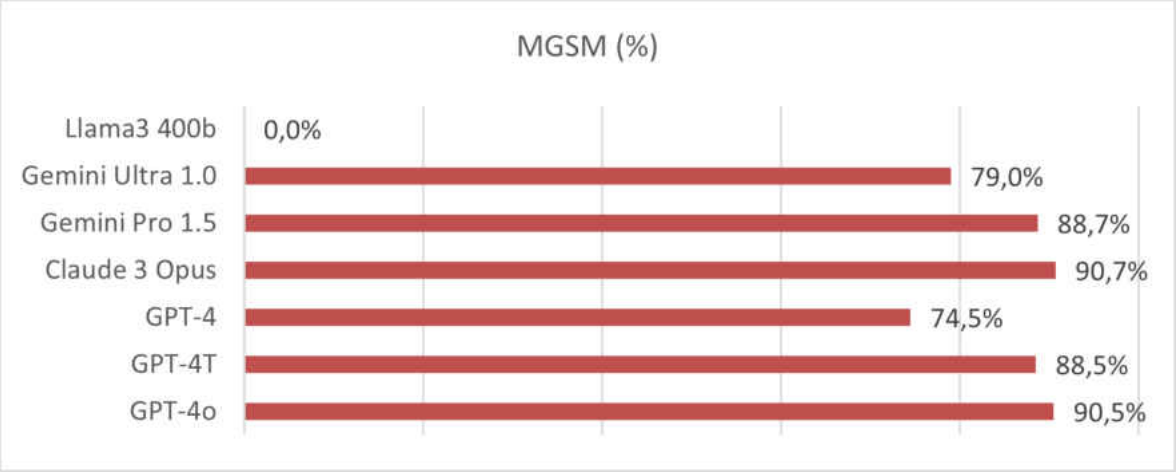

Figure 3.2: Multilingual Grade School Math in Percent

[3] 19.12.2024 `https://openai.com/index/hello-gpt-4o/`

Furthermore, ChatGPT-4o's ability to address multi-turn dialogs ensures that conversations flow naturally, with the machine remembering preceding interactions to offer follow-up responses. This characteristic complements personal engagement and encourages teenagers to continue interacting with the chatbot, essential for long-term mental health support. These competencies align to make a chatbot that can provide contextually suitable mental health recommendations [Bal23].

MMLU measures the model's potential to recognize and respond to a wide range of questions across numerous subjects [Iza+22]. This benchmark is essential for AidMax because teens might deliver up quite several topics at some stage in conversations about their mental health, from school-related pressure to personal existence challenges [Cos+20]. A chatbot that excels in this class can manage the diverse nature of these discussions, making sure that he gives relevant responses.

GPT-4o outperforms the benchmark in Figure 3.3 with an 88.7 percent score. This makes it suitable for AidMax, where versatility in conversation topics is vital. Comparatively GPT-4T and Claude 3 Opus are near with rankings of 86.5 percent and 86.8 percent. While good, they do not offer the same breadth and depth of information as GPT-4o.

Given that AidMax requires a version that can recognize and interact with various subjects and their emotional language, GPT-4o's main overall performance in MMLU ensures that it's well-suited to reply to complicated emotional and factual queries alike [Yeu+23].

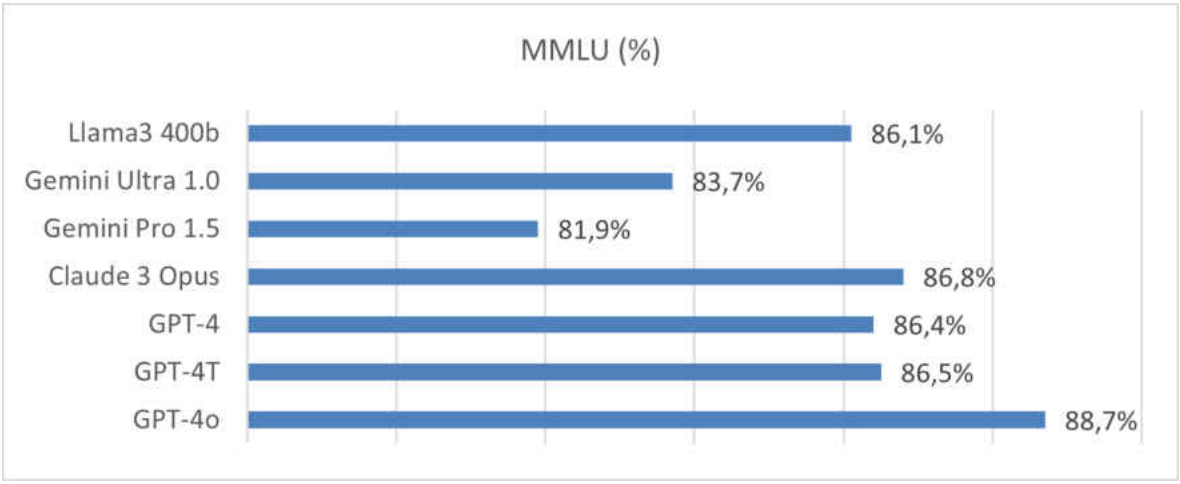

Figure 3.3: Massive Multitask Language Understanding in Percent

The chatbot's ability to learn and improve with every interaction guarantees that it remains effective while the user's mental health needs change over time. This ongoing adaption complements the user experience by ensuring that the chatbot maintains to offer relevant support, even after prolonged use. In the context of mental health, where the state of mind of users can change, such personalized support is invaluable [Bub+23].

GPQA checks the model's ability to answer a wide range of general-purpose questions [TC21]. In a mental health context, users may ask direct questions about their emotions, treatments or coping techniques. AidMax must be equipped to reply to these inquiries correctly.

GPT-4o rankings 53.6 percent in Figure 3.4, the highest among the models compared. This guarantees that AidMax can offer reliable information, which is critical for users looking for help with mental health. While Claude 3 Opus 50.4 percent and GPT-4T 48.0 percent are strong contenders, GPT-4o's edge in accuracy guarantees that AidMax can reply with better precision in moments while customers are searching for guidance.

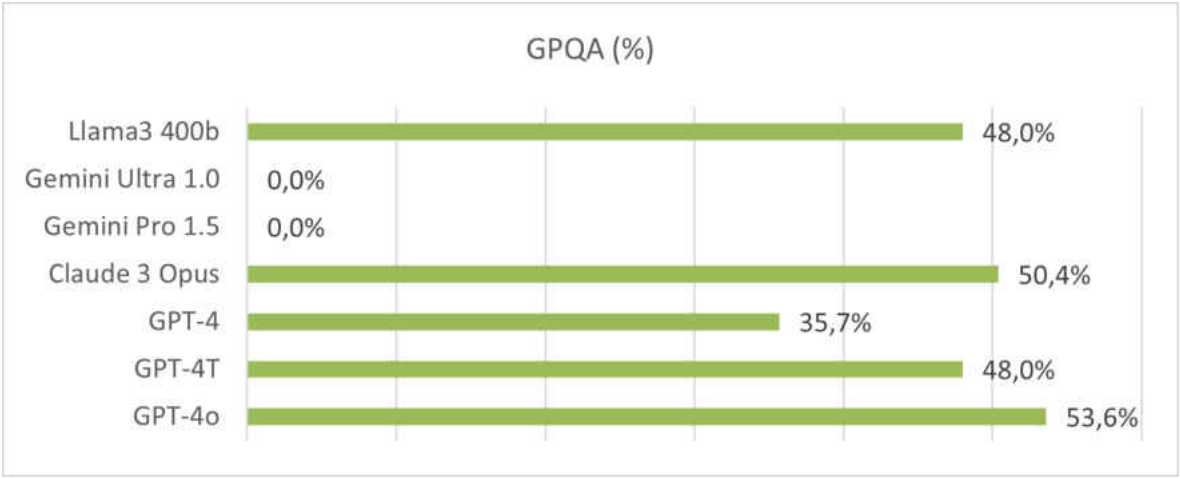

Figure 3.4: General Purpose Question Answering in Percent

Another element in selecting ChatGPT-4o is its use of NLP to provide personalized interactions. ChatGPT-4o improves its responses by gaining knowledge from previous user inputs, enabling it to provide more tailored mental health aid. Personalization is important in mental health interventions because each individual's emotional wishes are particular and in most cases hidden behind many different phrases [Hor+23]. By using NLP algorithms, ChatGPT-4o can modify its responses based on the user's language patterns, emotional cues and even the severity of mental health. This adaptability is crucial for developing a chatbot that feels responsive and understanding, two key elements in successful mental health interventions [Nor+23].

Users often write long paragraphs about their concerns [Gup+23]. AidMax needs to understand these messages, finding the most important information in long texts. DROP measures a model's ability to understand complex inputs. This benchmark includes operations like counting, addition and sorting. Therefore pushing the model beyond simple entity-typing shortcuts used in other comprehension tasks [Dua+19].

The F1 score is a widely used metric in NLP and other machine learning domains to evaluate model performance. It combines precision, the proportion of true positive predictions among all positive predictions and recall, the proportion of true positive predictions among all actual positive instances, into a single metric.

GPT-4T leads with a score of 86 in the benchmark in Figure 3.5, followed closely by GPT-4o at 83.4. Nevertheless GPT-4o can analyze long messages accurately, which is important for AidMax when users share personal stories. Managing detailed user inputs ensures that AidMax doesn't overlook expressions [Riy+23].

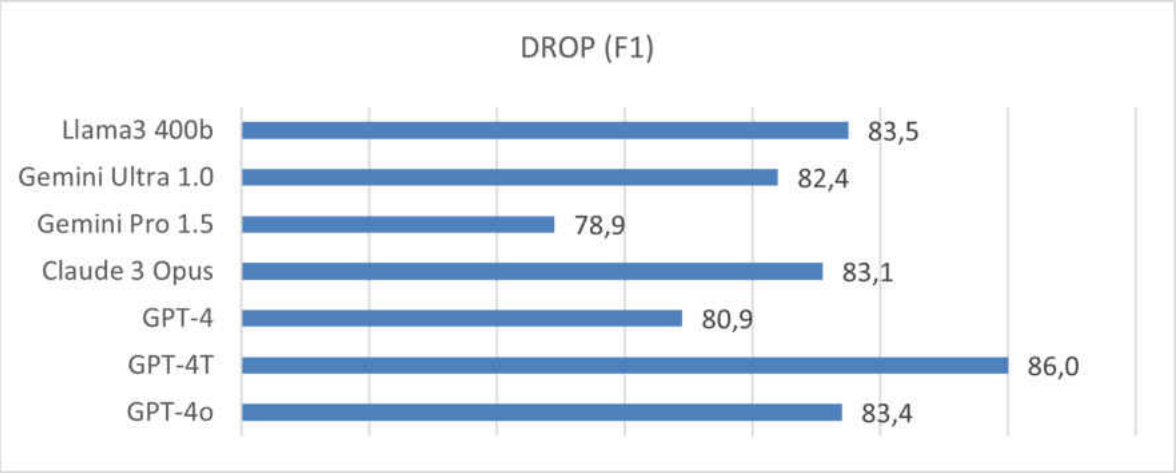

Figure 3.5: Discrete Reasoning Over Paragraphs in F1

The voice recognition market within the AI market is witnessing growth globally which can be seen in Figure 3.6. Fueled by factors such as the increasing use of digital technologies, growing health awareness and the convenience of online services. As technology advances, consumers are increasingly relying on voice recognition features for greater efficiency. This trend is also evident in the health care industry, where the use of voice-controlled systems for remote patient monitoring and virtual consultations is gaining momentum[4]. Therefore audio translation is important for mental health chatbots. Because they are seen as practical, reduce misunderstanding and ease self-expression at least Statista[5] is proofing this. Therefore AidMax can handle audio input, so users can express themselves in any way they want.

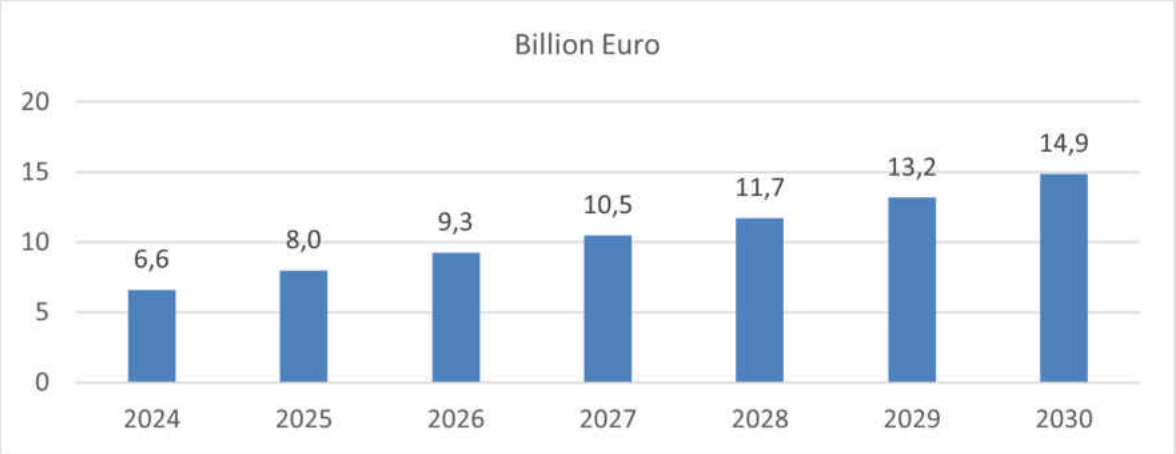

Figure 3.6: Speech Recognition World Market in Billion Euro

[4] 19.12.2024 https://de.statista.com/outlook/tmo/kuenstliche-intelligenz/computer-vision/sprach-erkennung/weltweit

[5] 19.12.2024 https://de.statista.com/infografik/16534/das-fuer-und-wider-von-sprachnachrichten/

Bilingual Evaluation Understudy (BLEU) is recognized as a metric for evaluating machine translation quality rather than translating spoken language. It operates by comparing a machine-generated translation with a set of human reference translations to assess similarity, which can correlate with translation quality [Rei18]. A higher BLEU score means the speech is understood and translated better.

GPT-4o gets the highest BLEU score of 42 on the CoVoST-2 dataset in Figure 3.7, showing it's the best at audio translation. AidMax can accurately transcribe and respond to voice inputs, including the emotional tone. Other models like Google's Gemini and AudioPalm-2 are also good at audio translation, but GPT-4o is the best which can be seen in Figure 3.7.

Audio translation lets people who don't like typing or have disabilities like dyslexia communicate easily. Research shows that speech can convey emotions, offering insights into a speaker's mental state. Studies on Speech Emotion Recognition (SER) highlight that pitch, intensity and energy are reliable indicators of emotions [Ras+23]. These features help AidMax identify emotional states, improving human-computer interactions by allowing systems to detect and respond to nuanced emotional cues. Teenagers often use different ways to communicate. Having a model that can translate audio well means they can use different ways to interact with it.

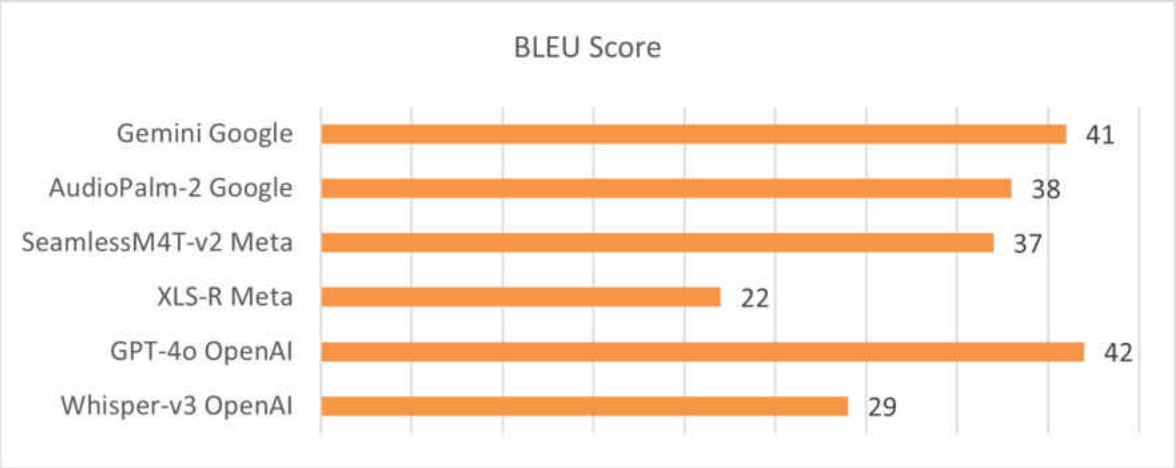

Figure 3.7: Audio Translation Comparing of the BLEU Score

GPT-4o is the best model for AidMax because it does well on important benchmark tests. That's why it is used as the engine behind AidMax, ensuring effective engagement with users. Also the University of Applied Sciences in Munich supplied the project with the API key of OpenAI which made the decision easier.

3.3 SendPulse

The integration of ChatGPT-4 into Instagram for mental health assistance needed an adaptable system that could manage many interactions without issues. SendPulse was selected as the integration platform because of its low price, capabilities in automating communication

and handling large message loads [6]. Also guaranteeing a secure and effective interaction flow. This part first assesses different management tools, then discusses the distinct characteristics and benefits of SendPulse that make it a good fit for incorporating GPT into Instagram, aligning with the mental health goals of this research.

During the evaluation of various platforms, the priority was to identify affordable services. Since AidMax is a project that relies on funding and aims to be accessible to all, it must remain budget-friendly. Taking into account the restricted budget, it was essential to thoroughly consider the cost of every platform. The weighted scoring method in the comparison study placed the most importance on cost with 50 percent because of its significant impact on sustainability.

The assessment included BotPenguin, Tidio, Appy Pie, Crisp and SendPulse in Figure 3.8. Each platform was assessed based on its functionality, user-friendliness, flexibility and support. Different categories were given weights ranging from 10 percent to 50 percent to show their importance. Functionality was slightly deprioritized to align the assessment with budget constraints. The following evaluation focused on ease of use, as a user-friendly interface can reduce both the time it takes for new users to get started and the time costs of training, which is crucial in settings with limited resources.

BotPenguin's performance reached 79 percent, indicating that it offers a comprehensive solution that is also versatile. Tidio excelled with an 80 percent rating because of its wide variety of features and user-friendly interface, even with a slightly higher monthly cost of approximately 27.26 EUR. Crisp followed closely, achieving a similar balance of functionality and support, earning a rating of 73 percent. Appy Pie's 75 percent rating was influenced by its limited flexibility and support, despite offering a low price of 11.28 EUR/month for 5,000 interactions, which could hinder scalability.

SendPulse was ultimately selected as the preferred platform for various reasons, despite receiving a score of 85 percent. To start with, the price of 7.88 EUR per month is the most affordable compared to the other choices, matching the financial goal. SendPulse's enhanced functionality rating of 18 percent means it provides a variety of features similar to those of more expensive competitors such as Tidio and Crisp. Even though it only has 4 percent support and 6 percent flexibility, its cost advantage and compatibility with important chatbot functions help minimize these drawbacks.

Another factor behind choosing SendPulse is its advanced automation features, essential for managing an AI chatbot on a platform as constantly evolving as Instagram. Mental health chatbots need an automated system that can manage numerous interactions at once without any human involvement. SendPulse's automation capabilities enable the chatbot to react promptly to user inquiries, ensuring adolescents in need of assistance receive immediate support, especially vital in emergencies such as suicidal thoughts [AS22].

[6] 19.12.2024 `https://SendPulse.com/`

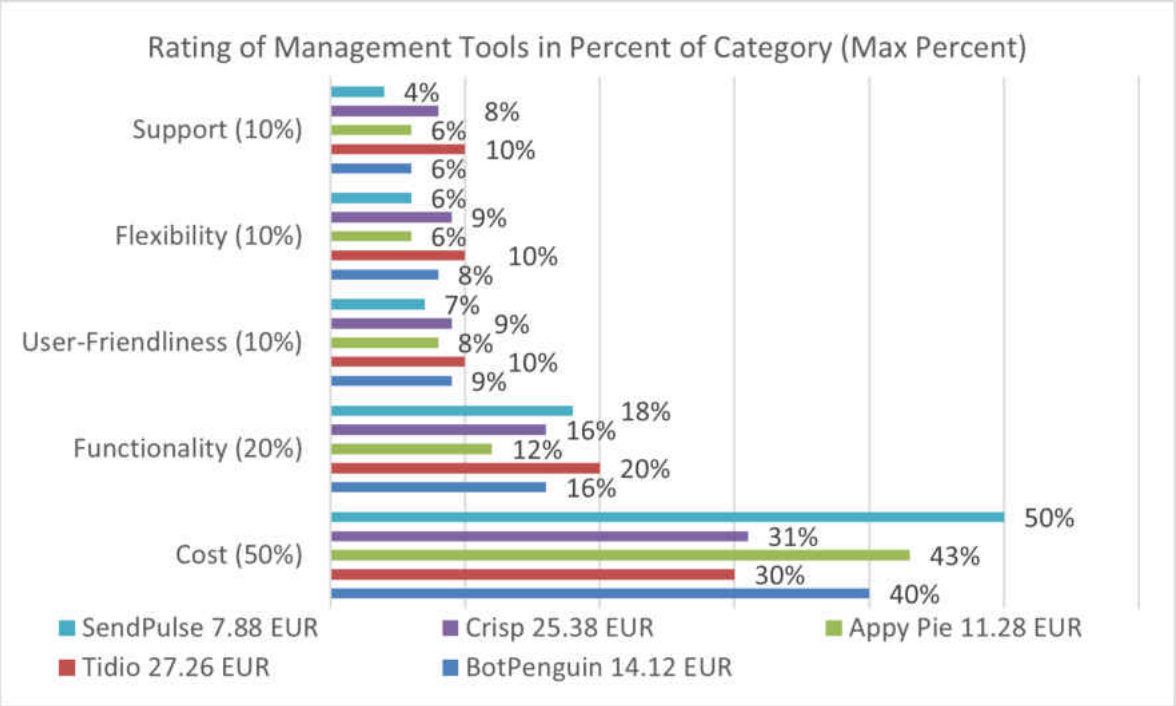

Figure 3.8: Rating of Management Tools in Percent of Category (Max Percent)

The process of integration includes setting up SendPulse to automate direct messages, plan responses and engage with visual elements such as smileys, which are crucial for interactively keeping users engaged. This aligns with the goal of integrating the chatbot into a familiar and interactive space to ensure users feel comfortable using it [Bou+21].

Privacy and security measures are necessary for mental health interventions to safeguard sensitive user information. It is important to protect interactions with adolescents who talk to AidMax on Instagram about their mental health conditions to prevent any potential data breaches. SendPulse provides security features to guarantee that user information is securely stored, complying with the privacy laws of the European Union. SendPulse's capability to automatically anonymize data guarantees the privacy of user information. This is important when working with at-risk groups such as teenagers. Their confidence in the platform's privacy measures is vital for continued use.

Overall SendPulse was selected for its low price, automation features and compatibility with Instagram's API. Also its scalability and capacity to handle large message volumes while safeguarding user privacy were important. These characteristics made it the perfect platform to incorporate ChatGPT into Instagram. This enables an interactive and secure mental health intervention for adolescents. Utilizing SendPulse allows the chatbot to interact effectively with users in a familiar setting, which offers immediate and personalized mental health assistance.

3.4 Integration

Every step in integrating ChatGPT-4 into Instagram using SendPulse for AidMax was executed with care. This ensured that the chatbot functions effectively, follows privacy laws and provides immediate crisis intervention if needed. The following details explain the rationale behind each step and how it contributes to achieving the end objective of the intervention.

The initial stage involved creating a professional Instagram profile for AidMax. This was essential because Instagram is the primary platform where the target audience engages. Developing a professional profile ensures that the chatbot comes across as dependable and encourages users to interact with it. It also provides access to the API features of Instagram. These are necessary for establishing a rapport with the chatbot and managing automated messaging services. Therefore AidMax also became a real figure for short videos on Instagram, TikTok and YouTube, to grow outreach and attract people in need of aid.

Next Instagram was connected to a related Facebook business page. This is necessary for accessing business features and the API essential for chatbot integration. It also ensures compliance with the guidelines of Instagram and Facebook's platforms. Therefore establishing the necessary infrastructure for automating responses and integrating an external platform like SendPulse.

Before the integration could proceed, the terms of use for Facebook and Instagram's APIs had to be accepted. Accepting these terms ensures that everything on the platform is done in line with the rules set out by Meta. This is important for keeping user data safe, especially when discussing sensitive topics like mental health.

SendPulse was integrated with Instagram through a code verification process. This step checks that the Instagram account is genuine, so SendPulse can automate messages. Connecting SendPulse to the Instagram profile lets AidMax automate interactions, send multimedia messages and track user engagement. This is important for managing a chatbot that provides 24/7 support to adolescents in need.

AidMax was designed with a focus on privacy, as adolescents often share personal information when discussing mental health. Therefore the possibility for the user was created to chat anonymously on the website aidmax.org. It is also explained on aidmax.org how the users' data is collected, stored and used. This transparency builds trust and ensures users feel safe interacting with the chatbot, which is crucial for maintaining engagement and delivering mental health support [Bal23].

Instagram is visual and multimedia-focused, so AidMax was modified to leverage these features. ChatGPT was integrated with the ability to share matching smileys that help users engage in the conversation because it feels more natural. This multimedia integration enhances user interaction and engagement, as users are more likely to interact with visual content than with text alone [Gan+22].

AidMax can spot risky interactions, like those involving suicidal thoughts. A trigger system was set up in SendPulse to identify suicidal tendencies. This ensures the chatbot can identify when a user may be in crisis and requires immediate intervention. Detecting these keywords activates an automated flow to manage the situation. This setup is vital for ensuring the chatbot acts as a warning system for crisis situations.

The trigger words were connected to a flow that sends a notification to a Telegram group of psychological experts. This step was added so experts can help when things are risky. The intervention means that a professional can review the case and take action if the chatbot can not help. This shows that the chatbot is there to help, not to replace people. If the chatbot detects words related to suicidal thoughts, it also sends this message to the user to call the crisis support service.

"Thank you very much for your trust. I'm worried about you because you seem to be in a very bad mood at the moment. Please click on the free number of the psychological crisis service and call them, because your life is priceless. Loving people are there for you around the clock :)" It offers validation, acknowledgment and a way to get help. A clickable phone number below makes it easy for users to get help without barriers. This method is in line with recommended crisis intervention strategies, where quick, kind and proactive reactions are important for helping [MP23].

The chatbot is powered by the OpenAIAPI and uses advanced NLP from ChatGPT-4o. This step makes sure that AidMax can handle complex and sensitive conversations in a way that feels empathetic. ChatGPT-4o allows the chatbot to maintain context, manage multi-turn conversations and offer tailored support. The OpenAIAPI for AidMax was configured with several parameters.

Adolescents and adults in their early twenties usually use short, informal and sometimes mysterious language on social media [HVD19]. The chatbot's responses were made shorter, relatable and fitting for the situation. AidMax should adapt to the slang and abbreviations used by teenagers in their communication. The changes through the prompt meant that ChatGPT could understand and respond informally. The chatbot was adapted to sound like a person to make users feel relaxed and open up about their feelings. This helps to build trust and confidence, which are important for successful mental health treatments [KB23].

The maximum response length was set to 100 tokens to ensure the chatbot responds relevantly. On Instagram, keeping it short is the best way to keep users engaged and make the conversation feel natural.

The temperature between 0 and 2 was set to 1 to make sure the chatbot responded in different ways, making it seem more natural. A higher temperature value allows for more diverse responses, vital for a dynamic experience.

The chatbot considers the last 50 messages from each user to provide personalized support. This lets AidMax remember context, so it can give relevant responses. Keeping a record of interactions means the chatbot can offer support based on what has been shared and the user's emotions. This form of adaptive learning ensures that users feel that their interactions are meaningful and that the chatbot understands their situation. Thereby enhancing user retention and engagement [Rat+22].

For example, if a user often talks about feeling anxious, the chatbot might focus on providing information about anxiety management strategies. Those involve breathing exercises, grounding techniques or CBT. This individualized assistance should create a connection that motivates the user to come back for ongoing involvement.

The last step was to design a prompt for AidMax to follow. This prompt tells the chatbot how to behave, so it can give helpful, kind and supportive responses. It encourages users to seek professional help when necessary and ensures that the chatbot's behavior aligns with the goals of the intervention.

"You are AidMax, a compassionate therapist. Treat the person like a family member and respond after a 3-second pause to simulate human interaction. First, assess the person's situation by asking gentle questions to understand their emotional state, thoughts and behaviors. Once you understand their situation, use the most appropriate therapeutic method: Cognitive Behavioral Therapy (CBT) to challenge negative thinking patterns, Dialectical Behavior Therapy (DBT) to promote mindfulness and emotional regulation, Behavioral Activation (BA) to encourage positive actions or Family-Focused Therapy (FFT) to improve family dynamics and communication. Keep each response under 20 words, with supportive, reflective or solution-focused questions tailored to their needs and matching smileys."

When making these changes, it was important to AI ethically. Particularly when working with at-risk groups such as teenagers. AidMax was updated to state its restrictions and function as an additional mental health aid in its profile. Users are educated on AidMax abilities and advised to consult a professional for serious problems to prevent dependence on the chatbot [KB23].

These changes were necessary to make AidMax a successful, empathetic and safe mental health tool on Instagram. Tailoring the intervention to maximize engagement, user satisfaction and improved mental health. This involved customizing the chatbot's interaction style, crisis response protocols, privacy measures, personalization features and multimedia integration.

Following this process, ChatGPT was integrated into Instagram via SendPulse to enable AidMax. This ensures he functions as a supportive tool while adhering to ethical and privacy standards. Each step was taken to optimize user engagement, provide immediate crisis support and integrate human oversight when necessary.

3.5 Qualitative Research Design

The component of this study aimed to explore the effectiveness and challenges associated with AidMax on Instagram as a tool for adolescent mental health. A qualitative research method was chosen for its ability to provide deep insights into experts' experiences and perceptions of the chatbot's capabilities as well as its limitations. This section describes the research design, which includes a thematic analysis to uncover the complex dynamics between user's interactions with the chatbot and mental health improvement.

The choice of a qualitative approach stemmed from the need to understand not only how AidMax works from a technical perspective, but also how its features are perceived and experienced by its target audience. This necessitates the use of qualitative data to explore the subjective and often complex emotional and psychological dimensions of user interaction. Studies have shown that qualitative methods such as interviews and thematic analyses are particularly effective in understanding these dimensions [CIP15]. They offer the opportunity to explore how AidMax is received, interpreted and used in the real world.

Experts in youth psychology, crisis intervention and AI were interviewed semi-structured to gather necessary information. This format lets experts share their insights while ensuring all topics are covered. The method was also based on previous research that showed how interviews can provide detailed feedback on digital health tools [Yin+20].

The expert interviews in this study covered AidMax's effectiveness. They focused on engagement, interpreting suicidal signals and reducing suicidal ideation. The questions were linked to the research questions and aimed to show how AidMax could help teenagers on social media. This section explains how each question relates to the research questions and why it was included in the interview.

1. *How do you evaluate your overall experience with AidMax, particularly regarding communication and user-friendliness?*

   This question is designed to see if AidMax is easy to use and communicates effectively. It relates to the first research question: How do people aged 15-25 engage with the AI chatbot on Instagram? The aim is to find out if the chatbot feels simple and friendly enough for young users, making them want to interact. If the experts point out problems, they can be solved before the users interact with AidMax.

2. *To what extent do you believe AidMax can foster engagement and responsiveness among adolescents?*

   This question explores how well AidMax can keep teenagers interested and responding. It also links to the first research question. The goal is to check if AidMax can create a comfortable space for users, making them want to come back and chat more. Engagement is key for any mental health tool because users need to stay involved for it to work.

3. *Are there specific features or approaches in AidMax that you find particularly helpful for teenagers with depressive symptoms?*

   This question looks for details about what works well in AidMax. It helps to see if there are any special features that might make a difference for teenagers dealing with depression. It connects to the first research question because knowing which parts of the chatbot help the most can show what encourages young users to use it and stay engaged.

4. *How well do you think AidMax can recognize and respond appropriately to depressive or suicidal thoughts?*

   The question focuses on AidMax's ability to detect and respond to serious issues. This links directly to the second research question: What are the limits of current AI models in understanding the language used by depressed users on social media? It checks if AidMax can spot and respond to warning signs correctly. Knowing this is crucial because the chatbot's ability to recognize such signals can prevent harm and offer immediate support [CIP15].

5. *Do you believe that AidMax is capable of understanding emotional nuances in communication? If not, what improvements would you recommend?*

   This question digs deeper into how well AidMax interprets emotions beyond words. It connects to the second research question as it tests whether the chatbot can handle indirect ways users might express their feelings. Teenagers might not always say that they feel bad,

so it's important that AidMax can understand these hidden cues. The answers help identify where the chatbot should be adapted.

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   This question asks experts to identify specific weaknesses in how AidMax processes language. It further supports the second research question by exploring examples of where the chatbot might misunderstand user communication. Knowing these details can help identify what needs improvement.

7. *Do you believe AidMax is capable of effectively reducing suicidal thoughts in young users? Please explain your answer.*

   This question is connected to the third research question: To what extent does the chatbot intervention reduce suicidal ideation in young social media users? It aims to find out if experts think AidMax helps to lower suicidal thoughts. The explanation part of the question lets experts provide specific reasons or examples, making the feedback more detailed.

8. *Can you describe specific situations where AidMax might successfully serve as a preventive measure against suicidal thoughts?*

   This question asks for real-life scenarios where AidMax might work well in preventing suicidal thoughts. It aims to see if the chatbot has potential in critical situations, showing where it can be effective as a mental health tool. Collecting these examples helps understand the applications of AidMax and whether it fits the needs of its users.

9. *Do you think AidMax is capable of reliably referring affected users to professional help in crises? How do you assess the quality of these referrals?*

   This question checks if AidMax can connect users to real-life support when needed. It supports the third research question, focusing on the chatbot's role as a bridge between digital and professional help. It's important to know if AidMax's referrals are useful and if they meet the standards needed in crises.

10. *Which psychological interventions are well-implemented in AidMax and which are missing?*

    This question explores whether AidMax includes important psychological techniques that could help users. It assesses how well these methods work within the chatbot and what might be missing to make it more effective. The feedback from this question shows if AidMax is using the right approaches for mental health support or if it needs to add more tools.

11. *How would you change AidMax to make it more effective for use in suicide prevention among adolescents?*

    This question invites suggestions on improving AidMax, connecting to all the research questions by identifying ways to increase engagement, understand complex emotions and reduce suicidal thoughts better. Expert input here is key to making the chatbot as effective and responsive as possible for its target audience.

12. *Do you believe integrating AidMax into Instagram could improve the reach and effectiveness of such AI-based solutions?*

    This question checks if experts think using Instagram makes AidMax more effective. It ties into the practical side of the first and third research questions by seeing if a social media platform helps reach more users and engage them better. The goal is to find out if the integration makes mental health support more accessible and useful for teenagers.

The questions were focused on four areas. How it feels to use AidMax, how he responds to depression, how he affects suicidal thoughts and how to improve. These questions allow for a focused discussion while leaving room for unexpected results. The interviews were transcribed using automatic transcription from Google[7] on an android device and translated from German to English using DeepL[8] in the browser.

For this study, Mayring's approach to inductive category formation was chosen for several reasons. This method aligns well with the open-ended, exploratory nature of qualitative research and is particularly suitable for examining nuanced, in-depth insights from expert interviews [May00].

One of the strengths of Mayring's method is its structured yet adaptable framework. By following a step-by-step procedure, beginning with a pilot phase and refining categories as patterns stabilize, the data could be organized while remaining open to modifications. This was especially useful given the dynamic and evolving field of AI in mental health support, where new ideas and considerations frequently emerged during the interviews. Mayring's approach, with its focus on maintaining the level of abstraction that suits the data, allowed it to address the complexity of expert opinions. Each category was crafted with sensitivity to the context, ensuring that the analysis preserved the detailed insights each expert provided [May00].

Mayring's method includes a pilot testing phase, in which a portion of the material is reviewed to refine the category definitions and levels of abstraction. This iterative process proved invaluable for developing a category system that fit the research. It also helped to ensure that the categories remained relevant. This reduced the risk of category drift and increased the reliability of the analysis by allowing adjustments before the full coding process. By working through the material line by line and refining categories throughout the process, Mayring's approach supports a deep interpretive engagement with the data [May00].

Lastly Mayring's approach emphasizes revisiting the category system to check alignment with the research question. This feature was essential in ensuring that the analysis focused on the core objectives of the study. This constant realignment with the research question ensured that the findings were not only insightful but directly relevant to understanding how AI-driven mental health interventions could be enhanced for teenage users [May00].

The following steps summarize how the analysis was conducted:

1. The initial stage involved defining a clear research question and aligning it with the background relevant to mental health and AI-supported interventions for youth. Here each research question from the introduction was used once for each interview.

[7] 19.12.2024 `https://play.google.com/store/apps/details?id=com.google.audio.hearing.visualization.accessibility.scribe&hl=de`

[8] 19.12.2024 `https://www.deepl.com/de/translator`

2. Before beginning the detailed reading, a selection criterion was established to guide the identification of the material. The category definition served as a selection filter, helping to determine which parts of the text were relevant to the study's focus. The level of abstraction was defined to balance the specificity and generality of the categories. This process was iterative, allowing adjustments during the pilot phase to refine category definitions.
3. Each interview transcript was reviewed line by line to identify passages that matched the established category definitions. For each relevant passage, a category was formulated aligning with the text's meaning. If a subsequent passage matched an existing category, it was subsumed under that category or otherwise a new one was created.
4. After categorizing 10-50 percent of the material, a review was conducted to stabilize the category system. The loop helped ensure that the categories remained relevant and sufficiently generalized, refining the analysis framework as needed. Adjustments were made if the categories were too numerous, prompting revisions in the level of abstraction.
5. The entire dataset was reviewed again, applying the rules across all material. This ensured a systematic approach and enhanced the validity of the findings by following the same procedures from start to finish.
6. A main system was developed by grouping related categories. This synthesis provided a structured overview of the themes, facilitating a clearer interpretation of the findings.
7. The category system was interpreted within the context of the research question. Where applicable frequency of category occurrences were conducted to identify prominent themes. This interpretation linked the developed categories to the study's initial aims, allowing for a comprehensive and nuanced understanding of the interview data.

The above steps were done for each research question. This lead to the different categories for each interview which will be described in the result chapter and visible in figure 4.1.

3.6 Quantitative Research Design

The quantitative part of this study aimed to gather measurable data about how effective and engaging AidMax is as a mental health tool on Instagram. A survey was developed on the website to collect responses from users aged 15 to 25 based on the empirical method of Aithal [AA20]. Each survey question was created to directly relate to the research questions of the thesis, providing a clear link between user experiences and measurable outcomes. Gamification aspects were also implemented in the survey. Like a picture of AidMax with different motivating text in a speech bubble above its head, a loading bar to show the user how much he has already accomplished and a score with 100 points added for each question. The following explains each survey question in detail, showing its relevance to the research questions and providing insights on how the data supports the study's goals.

1. *How old are you?*

   This question collects demographic data to confirm that the chatbot is reaching the intended age group. It helps to ensure that the data is relevant to the target demographic. This is important because the research focuses on understanding how adolescents between 15 and 25 years interact with a mental health tool on Instagram.

2. *With which gender do you identify yourself?*

   Understanding gender distribution helps in analyzing how different groups might engage differently with AidMax. Gender-specific analysis can reveal if the chatbot's features are effective across all genders. Which is essential for tailoring mental health interventions.

3. *How much time do you spend daily on Instagram?*

   This question checks the daily Instagram usage of participants, which is important to understand their potential exposure to AidMax. It relates to the first research question: How do individuals within the 15-25 age group engage with a mental health support AI chatbot on Instagram? Knowing the usage frequency can indicate whether higher activity levels on Instagram correlate with more frequent use of AidMax.

4. *How often have you used AidMax?*

   This question measures the frequency of chatbot use, which is a key metric for evaluating engagement levels. It is directly connected to the first research question and helps determine if users are interacting with AidMax consistently, which could indicate its perceived value and effectiveness.

5. *How long does an average session with AidMax last?*

   This question captures session duration, providing insight into user engagement. Longer sessions could mean that users are finding the conversations meaningful or supportive. This connects to the first research question as it measures the depth of user interaction.

6. *What types of issues have you discussed with AidMax?*

   This question aims to understand the range of mental health concerns users bring to AidMax. It links to the first research question by showing whether the chatbot is effective across stress, anxiety or depression.

7. *Do you feel that AidMax has provided you with helpful responses and support?*

   This question measures the perceived effectiveness of the chatbot. It relates to the overall aim of the research: to determine if the chatbot can positively impact user mental health. Positive responses would suggest that AidMax is meeting its goal of offering valuable support.

8. *To what extent have your symptoms improved after using AidMax?*

   The question gathers data on whether users have noticed a positive symptom change. This directly links to the third research question: To what extent does an AI chatbot intervention reduce the risk of suicidal ideation among young social media users? It provides measurable outcomes that can show if AidMax effectively reduces symptoms like anxiety or depression.

9. *Do you feel that AidMax understands and interprets your concerns correctly?*

   This question focuses on AidMax's emotional understanding. It connects to the second research question: What are the limitations of current AI models in interpreting and responding to the language used by depressed users on social media? It assesses whether users feel heard and understood, which is vital for an AI-based mental health intervention.

10. *How likely are you to use AidMax again when you feel bad?*

    This question measures user retention and satisfaction, as the likelihood of returning to the chatbot indicates its perceived value. It relates to the first research question by evaluating whether users will continue engaging with AidMax.

11. *Did you have any privacy or data protection concerns when using AidMax?*

    This question assesses whether privacy issues impact user engagement, linking back to discussions in the qualitative and quantitative research sections about barriers to using digital health interventions. It is crucial to understand these concerns to improve user trust and engagement.

12. *How would you rate AidMax's emotional competence?*

    This question asks users to evaluate how well the chatbot understands and responds to their emotions. This connects to the second research question about the chatbot's ability to handle complex emotional cues. It provides insight into how well AidMax engages users emotionally and where improvements might be needed.

13. *Do you think AidMax can understand cultural or linguistic nuances like dialect, sarcasm or irony?*

    This question tests AidMax's ability to pick up on subtle cues that are often present in adolescent communication. It further supports the second research question by evaluating whether the chatbot's natural language processing capabilities are effective in interactions with young users.

14. *Has AidMax ever encouraged you to seek professional help?*

    This question measures whether the chatbot responsibly refers users to professional services when necessary, linking to the third research question about its role in reducing suicidal ideation. It checks if AidMax can act as a bridge between digital and professional support, which is vital for ethical digital interventions.

15. *Would you recommend AidMax to others in a similar situation?*

    This final question assesses overall satisfaction and reliability. If users are willing to recommend AidMax, it suggests that they find it trustworthy. This connects to all research questions, as it summarizes user satisfaction and the perceived impact of the chatbot.

    The quantitative survey was designed with these questions to gather relevant and measurable data that aligns with the research aims. Each question helps to collect specific information about user engagement, effectiveness and satisfaction. This should provide the data required to evaluate AidMax as a digital mental health intervention on Instagram.

4 Results

In this chapter, the results of the expert interviews and the quantitative survey will be analyzed. The findings will serve as a foundation for addressing the research questions in the subsequent discussion chapter.

4.1 Qualitative Interviews

In this section, the results of the analyzed expert interviews and the adoption of the prompt for AidMax are displayed. Each interview was analyzed three times with a different research question in mind. Therefore the categorys in Figure 4.1, which emerged through Mayring's technique are also named right after the interview at the beginning of the analysis.

Experts	**Engagement?**	**Interpreting?**	**Suicidal thoughts?**
Aicher	ease of use, responsiveness, motivation emphasis, accessible	despair recognition, missed nuances, insufficient sensitivity	preventive support, crisis referral, suicidal ideation
Unger	interaction consistency, accessibility, broad reach, psychoeducation	basic signal understanding, nuance detection gaps, risk recognition	prevention support, reliable referrals, education, destigmatization
Coordinator	friendly responses, accessibility, help, proactive engagement	nuance detection, communication barriers, detecting risks	preventive tool, reliable referral systems, tailored interventions
Daiminger	ease of use, professional communication, dialog-oriented, engagement	verbal cue recognition, emotional analysis gaps, depression indicators	preventive support, reliable referral systems, expanded interventions
Stoiber	ease of use, provision support, referral capabilities, appropriate communication	language inconsistencies, deeper probing lack, unclear competency boundaries	preventive questioning, referral reliability, expanded psychological interventions
Janßen	responsiveness, engagement mechanisms, graphic design	emotional exploration, distress sensitivity, communication challenges	early-stage support, referral reliability, communication improvement
Krämer	accessibility, integration, solution-oriented approach, potential reach	emotion recognition, short responses, nonverbal detection	early-stage support, reliable referrals, preventive strategies
Menzel	usability, young users engagement, emotion detection, integration	recognizing emotions, interpreting communication, adapting language	early-stage intervention, loneliness support, referral mechanisms

Table 4.1: Categorys of Mayring's Analysis

4.1.1 Psychiatric Crisis Service

At first, the psychologist Sabine Aicher was interviewed. She is a state youth teacher, psychotherapist and works in the psychiatric crisis service. She helps people with depression, burnout, anxiety, panic attacks, crises and relationships. Therefore her feedback is helpful to adapt AidMax and gain insight into her twenty years of working with young adults.

1. *Dear Miss Aicher, could you share your general experience with AidMax, especially in terms of communication and ease of use?*

   Well, I tried the application today. The user-friendliness is great. As a layman, I get on well with the application. I immediately found out how to get started and the fact that you can send voice messages makes it relatively easy to use. You don't have to type much. Communication is instant and the answers to my questions or needs are very quick.

2. *To what extent do you think AidMax can promote young people's commitment and willingness to respond?*

   The commitment and responsiveness of young people are strongly encouraged. Young people often need someone to motivate them. AidMax demonstrates approaches by emphasizing small successes and first steps. For curious young people, this could be a good opportunity to try out the help of AI. For young people with severe depressive episodes, AidMax may be more difficult to implement, but it could be a first step toward further help.

3. *Are there any special functions or approaches in AidMax that you consider particularly helpful for young people with depressive symptoms?*

   The immediate answers on AidMax, the advice and suggestions on how other people might react are very helpful. AidMax is particularly supportive for young people with depressive symptoms. They receive immediate solutions for hopeless situations, feelings or conditions.

4. *Let's move on to the interpretation and reaction to depressive and suicidal signals. In your opinion, how well can AidMax recognize depressive or suicidal thoughts and react appropriately to them?*

   AidMax is able to react very well and offers immediate help. If things get really serious, it refers them directly to the crisis service. He responds to the feelings of young people and helps them to find a listening ear for their depressive thoughts.

5. *Do you have the impression that AidMax can understand the emotional nuances in communication such as sarcasm, irony or despair? If not, what should be improved?*

   As far as I have tested the application, AidMax can filter out despair in teenagers, interpret it and react accordingly. I haven't found irony and subtle sarcasm yet. I believe that AidMax can decode these emotional elements, even if there is still room for improvement.

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   I think AidMax still has too little therapeutic experience in this area and would have to deal more intensively with the topic of depression to recognize even the smallest clues. Young people often don't express their feelings clearly, especially when they are in distress and AidMax could react more sensitively here.

7. *Do you think AidMax can effectively reduce suicidal thoughts in young people?*

   I would rephrase the question slightly. AidMax might be able to reduce depressive episodes, but suicidal thoughts belong in specialized hands. Suicidal thoughts often arise after a long period of depression and special measures are needed to treat them. AidMax could help to guide young people into a healthy environment and motivate them to seek therapeutic help and develop self-help strategies.

8. *Can you describe specific situations in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   Preventively, AidMax could support young people before they get into a hopeless situation by helping them break out of negative thought patterns, strengthen their self-esteem and socialize. If suicidal thoughts do arise, AidMax provides immediate help and gives young people the opportunity to seek professional support directly.

9. *Do you believe AidMax can reliably refer young people in crises to professional help? How do you rate the quality of these referrals?*

   In crisis situations, professional help is offered by the crisis service. It's great that young people can be connected directly by simply tapping without having to do any research themselves. However, I am somewhat critical of the quality of referrals to professional psychotherapy, as it is difficult to provide therapists at all times. I would be careful with promises here.

10. *Which psychological interventions, such as CBT or emotional validation, are implemented well at AidMax and which do you think are missing?*

    In my test, I found little CBT. There were more general suggestions such as breathing or going for a walk. It would be helpful to offer young people more targeted techniques for dealing with their emotions and inner conflicts. Every young person needs something different, so the program should be more differentiated to meet their needs.

11. *How would you change AidMax to make it more effective for use in suicide prevention among adolescents?*

    More educational work would be important, for example about depressive spirals and how suicidal behavior develops. Information on the AidMax website or videos on Instagram could help young people to learn more about these processes and seek support at an early stage.

12. *Do you think the integration of AidMax on platforms such as Instagram could improve the reach and effectiveness of such AI-supported solutions?*

    There is no substitute for the one-to-one setting with a therapist who looks you in the eye and gives you their full attention. Nevertheless, AidMax can lower the barriers to seeking help and offer a valuable addition.

The first research question explored how young people engage with the AI chatbot. Here categories like ease of use, immediate responsiveness, motivation through success emphasis and accessibility for depressive users emerged. These were formed by identifying recurring themes in Aicher's descriptions, such as her appreciation of the voice messaging feature, which simplifies communication and makes the application accessible to non-tech users. Aicher emphasized

that AidMax's immediate responses provided a sense of connection and encouragement, especially for those testing mental health support. The focus on small, achievable steps to build confidence and commitment stood out as an engagement strategy. This category was shaped by her observation that such incremental successes could motivate curious users. She also noted that those with severe depressive symptoms might struggle with the chat.

For the second research question, which examined the limitations of AI in interpreting the language used by depressed individuals, the analysis revealed categories such as recognition of despair, missed nuances and insufficient sensitivity. These categories arose from Aicher's reflections on how well AidMax detected overt expressions of distress but struggled with more nuanced emotional cues like sarcasm or irony. The line-by-line coding revealed that while despair was interpreted effectively, subtle linguistic signals often went unnoticed. This gap was noted as a limitation of the current AI model and Aicher suggested that the application could benefit from enhanced sensitivity to vague or indirect expressions of distress.

In analyzing the third research question, which explored AidMax's potential to reduce suicidal ideation, categories such as preventive support, crisis referral and limitations in suicidal ideation management were identified. These categories stemmed from Aicher's emphasis on the application's role in breaking negative thought patterns, fostering self-esteem and encouraging early intervention. Preventive support was captured in her statements about how AidMax could help young users reframe their thinking and strengthen their social ties before reaching a crisis point. The application's ability to connect users to crisis services with minimal effort was a key element in the crisis referral category, which reflected both its strengths and its reliance on external professionals for handling severe cases. Aicher acknowledged the application's limitations in addressing suicidal ideation comprehensively, as such situations often require specialized therapeutic interventions.

4.1.2 Interview Child Care Psychologist

Katharina Unger is a licensed psychotherapist with experience in clinical and therapeutic settings. She has worked as a psychologist in various roles, including at a child care center, in psychiatric care and as a psychotherapist. Her expertise in psychotherapeutic care, particularly for children and psychiatric patients, provides invaluable insights for AidMax's development, especially in addressing adolescent mental health needs and creating user-sensitive interventions.

1. *How would you rate your general experience with AidMax, especially in terms of communication and user-friendliness?*

   Well, I found it very pleasant at first. I started by just writing text and then tried out speech recognition. I didn't notice much difference in the response. I tried to put myself in the shoes of an adolescent patient of mine and tried to recreate that a little. I had the feeling that AidMax responded relatively similarly to me both when writing and speaking.

2. *To what extent do you think AidMax can encourage young people's engagement and responsiveness?*

   AidMax can help a lot, especially because it's low-threshold via Instagram and can be used quickly. It has great potential, especially on platforms like Instagram and TikTok.

3. *Are there any special functions or approaches in AidMax that you consider particularly helpful for young people with depressive symptoms?*

   I could imagine that metaphors or figurative language, but also simple psychoeducation, would be helpful. For example, I often use the metaphor of "rose-colored glasses" and the opposite, "black glasses", to illustrate how depression affects perception. For suicidal thoughts, I often use the "toilet roll metaphor", where you only have a limited field of vision and only perceive reality through a small tube. Such imagery could help young people to better understand their feelings.

4. *In your opinion, how well can AidMax recognize depressive or suicidal thoughts and react appropriately?*

   I had the feeling that AidMax responded to me appropriately. However, I would like it if it not only reacted to signals but also actively addressed them. Many people are afraid to address such issues because they think it could exacerbate the problem. In reality, however, it is important to talk about it openly. AidMax could ask for specific thoughts or strategies to destigmatize and take the pressure off.

5. *Do you feel that AidMax can understand emotional nuances such as sarcasm, irony or despair?*

   It's difficult to say, as I didn't express myself sarcastically in this situation. At least I didn't notice in a negative way that AidMax couldn't recognize these nuances. But I also don't think that this is a major problem in this form.

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   I haven't noticed anything specific, but it would be useful to look for certain risk factors, such as extreme hopelessness, severe guilt or low sensitivity to pain. If several of these factors apply, AidMax could refer to crisis services more quickly.

7. *Do you think AidMax can effectively reduce suicidal thoughts in young users?*

   Yes, definitely. Simply because there is a platform where people can open up and find understanding.

8. *Can you describe specific situations in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   Yes, I could imagine many situations where someone has difficulties at school, in training or at university. AidMax can help before suicidal thoughts even occur by offering support and encouraging reflection.

9. *Do you believe AidMax can reliably refer affected users to professional help in crises? How do you rate the quality of these referrals?*

   It would be helpful if AidMax had even more emergency contacts and telephone numbers in the background. There is a platform called "U25' that lists many contacts. It would also be useful to refer to therapist search pages of the health insurance associations.

10. *Which psychological interventions such as CBT or emotional validation are implemented well in AidMax and which are missing?*

    There is a lot of emotional validation, which I think is very good. What is perhaps still missing is more education about suicidal thoughts and depressive moods to destigmatize the topic and impart knowledge. AidMax also tries to strengthen self-image, which is very helpful.

11. *Is there anything you would specifically change about AidMax to make it more effective for use in suicide prevention among young people?*

    It would be helpful to provide even more concrete offers of help and to include influencers on platforms such as Instagram and TikTok who speak authentically about similar experiences and show that others are also struggling with difficult feelings.

12. *Do you think the integration of AidMax on Instagram could improve the reach and effectiveness of such AI-powered solutions?*

    Yes, it makes sense. Young people use Instagram a lot and AidMax could become more accessible and better known as a result.

Katharina Unger's perspective on AidMax revealed its strengths in promoting engagement among young people. Categories such as consistency in interaction, low-threshold accessibility, the potential for a broad reach and psycho-education highlighted how AidMax's design supports immediate engagement. Unger noted that responses were consistent whether users typed or spoke, reassuring for adolescents who might prefer different communication methods. The integration of AidMax on platforms like Instagram and TikTok was seen as a way to reach young users quickly, capitalizing on the platform's accessibility. She also emphasized the value of using metaphors and simple educational techniques to help young people better understand their feelings.

For limitations in linguistic interpretation, categories such as basic understanding of signals, gaps in nuance detection and risk factor recognition emerged. Unger noted that while AidMax effectively responded to emotions, it could not interpret indirect cues like sarcasm or nuanced despair. She suggested that a greater focus on identifying risk factors, such as hopelessness, guilt or desensitization to pain, could enhance the application's ability to detect when immediate action is necessary. Although she did not encounter specific failures, Unger proposed that AidMax should proactively address these gaps to better serve users in crisis.

Regarding suicide prevention, categories such as prevention through support, reliable referrals and destigmatization stood out. Unger believed that AidMax could intervene before suicidal thoughts arise by offering support during challenges like school difficulties. She suggested expanding the application's network of emergency contacts, citing examples like the U25 platform to improve its referral system. Unger also valued the application's efforts in emotional validation and self-strengthening but highlighted the need for more education to destigmatize suicidal thoughts. She advocated for collaborations with influencers on Instagram and TikTok, as their authentic voices could encourage young people to seek help. Through these strategies, Unger saw AidMax as a valuable tool for prevention and crisis management, even if it requires enhancements in resource availability and proactive outreach.

4.1.3 Coordinator Crisis Intervention Team

The expert wanted to stay anonymous because of its position as coordinator of a state crisis team. Nevertheless he is an expert in AidMax's field because of his extensive experience in mental health and crisis management. He has expertise in managing psychological emergencies, which offers insights into crisis response strategies. His role as a state school psychologist provides valuable knowledge about adolescent mental health, the challenges faced by young people and the most effective ways to engage this demographic. His background as an emergency psychologist equips him with practical skills for identifying mental health needs, which are critical for refining AidMax's ability to respond to suicidal signals.

1. *How would you rate your overall experience with AidMax, especially in terms of communication and user-friendliness?*

   The user-friendliness is great. He responds immediately and in a friendly tone. The sentences are concrete and understandable. It's not too pushy, although I think it could perhaps be a bit more proactive. Apart from that, I also like the integration with Instagram. Of course, you have to pay attention to the data protection guidelines, but if it stays that way, I think it's fine to chat like that.

2. *To what extent do you think AidMax can encourage young people to get involved and respond?*

   That depends on how well AidMax manages to ask the right questions and reads between the lines. There is certainly still a need for further development. I could imagine that AidMax could be very helpful as first aid, especially by quickly referring people to professional services.

3. *Are there any special functions or approaches in AidMax that you consider particularly helpful for young people with depressive symptoms?*

   I think the check function is a good idea. Many are reluctant to make phone calls or visit physical counseling centers. As most young people use smartphones and Instagram, AidMax could be a good way to gain access.

4. *In your opinion, how well can AidMax recognize depressive or suicidal thoughts and respond appropriately?*

   I still see weaknesses here at the moment. The beginnings are there, but I strongly advise against switching the function live yet. The responsibility is huge and the system needs to work reliably before it is released to the public.

5. *Do you have the impression that AidMax can understand emotional nuances such as sarcasm, irony or despair? What could be improved here?*

   Out of ten attempts, AidMax did not understand the nuances correctly in nine of them. When I tried to be sarcastic or ironic, he usually didn't get it. It would make sense for AidMax to ask more often instead of assuming he knows what is meant. For example, he could ask: "Are you serious? Can you rephrase it?"

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   Depressed people often communicate very little and in nuances. AidMax should be able to find out more from the little that is said by asking specific questions. For example, if a depressed user answers "I don't know" and AidMax then only writes "OK, get in touch later" this could break off communication. Here AidMax would have to ask sensitively without being too intrusive in order not to lose trust.

7. *Do you think AidMax is suitable for effectively reducing suicidal thoughts among young users?*

   I think it is difficult to effectively reduce suicidal thoughts. Suicidal behavior has different causes and motives. Many people who use a chatbot are looking for help. But others want to punish someone or get attention, for example. People who are very suicidal often need to be kept in a locked room, as they need social closeness and support at such times, which a chatbot cannot provide.

8. *Can you describe specific situations in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   If someone is already active in the chat, AidMax could serve as a link between the person and professional help, for example, to bridge a crisis for a night or two. It would be helpful to offer breathing and mindfulness exercises or sleep meditation and refer people to professional hotlines, such as the telephone counseling service or other psychological emergency numbers.

9. *Do you believe AidMax can reliably refer affected users to professional help in crises?*

   I hope that AidMax will be able to do this reliably in the future. It would be helpful if AidMax could ask the user for their postcode, for example and then recommend the nearest clinic or outpatient clinic. It would also be useful to have emergency numbers in the background so that rapid referral is possible.

10. *Which psychological interventions such as CBT or emotional validation are implemented well in AidMax and which do you think are missing?*

    Emotional validation is well implemented in AidMax. However, it would be useful to expand CBT even further. For people in different stages of suicidal behavior, AidMax could be supported with mindfulness exercises or meditation.

11. *What would you change about AidMax to make it more effective for use in suicide prevention among young people?*

    One important point is the approach. AidMax currently has a rather feminine appeal. To appeal to a larger proportion of young people, it would be important for AidMax to appeal equally to both boys and girls. It would be helpful if AidMax used simple, clear sentences and carried out a short initial inquiry to better understand the reality of the user's life.

12. *Do you think the integration of AidMax on Instagram could improve the reach and effectiveness of such AI-powered solutions?*

    I think so. My biggest concern would be data privacy. Maybe AidMax on Instagram could point out that it's safer to continue writing on your website. However the advantage of Instagram is that young people can send voice messages, which makes communication easier.

The Crisis Intervention Coordinator emphasized immediate and friendly responses, accessibility via Instagram, reluctance to use traditional help and proactive engagement as key aspects of how young people interact with AidMax. The chatbot's friendly tone and concrete, understandable sentences made communication approachable and non-intimidating. The integration with Instagram lowered barriers, providing a space where young people could initiate contact without the formalities of traditional support systems. For users hesitant to call helplines or visit physical counseling centers, AidMax was seen as a valuable alternative. Tailored interventions, including expanded cognitive-behavioral techniques and a more gender-neutral design, could make AidMax more appealing and effective for diverse users. However the coordinator noted that more proactive engagement, such as asking follow-up questions or gently encouraging deeper interaction, could sustain communication.

When discussing the limitations of AidMax, the coordinator highlighted challenges in nuance detection, user communication barriers and detecting risk factors. AidMax often failed to interpret subtle emotional cues like sarcasm or irony, which was observed in most test cases. This inability to grasp nuanced expressions limits its ability to fully understand the emotional state of users. Additionally, vague responses from users, such as *"I don't know"*, were met with simplistic replies, risking a breakdown in communication. The chatbot needs to ask sensitive, follow-up questions to maintain trust and uncover deeper issues. AidMax's ability to detect critical risk factors, such as extreme hopelessness, was also seen as insufficient. Developing more robust recognition mechanisms for these signs could improve its responsiveness to users in crisis.

In the context of suicide prevention, the coordinator identified the preventive tool, reliable referral systems and tailored interventions as essential components. AidMax's ability to provide mindfulness exercises and bridge crises over short periods was acknowledged as a strength. However the referral system requires enhancements, such as location-based recommendations and an expanded database of emergency contacts, to connect users with professional help. While the chatbot offers valuable support, the coordinator stressed that it cannot replace the human connection required for individuals with severe suicidal behaviors. Nonetheless its integration on Instagram was seen as a promising way to reach young people, though privacy concerns were raised. Encouraging users to transition to AidMax's website for more secure conversations was suggested as a way to address these concerns.

4.1.4 Psychotherapy Master Head

Professor Dr. Christine Daiminger was interviewed for AidMax due to her extensive expertise in psychotherapy, particularly CBT and her leadership role as the head of a master's program in psychotherapy. Her academic focus on social issues, chronic illness and disability aligns closely with AidMax's mission to support mental health. Additionally her knowledge of

psychological counseling, therapy history and the psychosocial impact of burnout provides insights into addressing the mental health needs of adolescents. Her perspective enhances AidMax's development, particularly in creating effective interventions tailored to young users.

1. *How would you rate your general experience with AidMax, particularly in communication and user-friendliness?*

   I can only give a brief assessment as I have only tested the chat briefly. The ease of use is very straightforward. What I don't know is how the young people themselves react to it. The communication is professional and the answers are well formulated in crisis intervention and dialog-oriented approaches. As a professional user, I found the responses very appropriate. From a user perspective, however, I could imagine that it might get a little tiring at some point if the conversation goes on for a very long time.

2. *To what extent do you think AidMax can encourage young people to engage and respond?*

   On Instagram users could also send voice messages that are analyzed to include vocal tones and background noise. This could encourage engagement, especially if AidMax adapts the reactions and responses more closely to young people's language. The language in the chat comes across as very matter-of-fact and professional, which could have a positive effect on some young people, but may be less appealing to others.

3. *Are there special functions or approaches in AidMax that you consider helpful for young people with depressive symptoms?*

   Features that encourage young people to talk to others about their feelings could be helpful, as social support is important. For example, a question like "Have you talked to anyone about this?" is a good intervention to encourage young people to confide in someone.

4. *In your opinion, how well can AidMax recognize depressive or suicidal thoughts and respond appropriately?*

   I don't have enough experience with the system, but AidMax should also make sure to proactively offer help if the communication becomes very depressive. People with moderate or severe depression could otherwise drop out before they receive any real support.

5. *Do you have the impression that AidMax can understand emotional nuances such as sarcasm, irony or despair?*

   For simple emotional statements such as "Everything is stupid", AidMax responded appropriately. With more complex emotions, I can't judge that yet.

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   Verbal characteristics such as speaking speed, monotony or slow speech would be interesting, as linguistic characteristics can indicate depressive moods. However, it would be a challenge to reliably recognize and interpret such features.

7. *Do you think AidMax is suitable for effectively reducing suicidal thoughts in young users?*

   I am not sure whether AidMax can effectively reduce suicidal thoughts. However, it could be helpful to offer an anonymized service and refer those affected to professional services. In cases of serious suicidal behavior, human contact and a therapeutic environment are essential to provide the necessary support.

8. *Can you describe specific situations in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   In situations where young people are still actively seeking support, AidMax could help them by encouraging them to seek help. Suicidal thoughts can have different stages and a chatbot could be supportive in milder cases by destigmatizing the topic and pointing out offers of help.

9. *Do you believe that AidMax can reliably refer affected users to professional help in crises?*

   In crisis situations, it is crucial that AidMax can reliably refer users to professional help. One option would be to ask for the user's postcode and recommend the nearest emergency clinic or hospital.

10. *Which psychological interventions such as CBT or emotional validation are implemented well in AidMax and which are missing?*

    AidMax implements emotional validation well by responding to the user's emotions. However, CBT could be developed further. Mindfulness or goal development approaches would also be valuable additions to show users long-term help options.

11. *What would you change about AidMax to make it more effective for use in suicide prevention among young people?*

    I would suggest taking a better account of gender targeting to appeal to both male and female users. AidMax could also be better adapted to the language level and regional reality of young people. A short survey at the beginning could help to better understand the needs of the users.

12. *Do you think the integration of AidMax on platforms like Instagram could improve the reach and effectiveness of such AI-powered solutions?*

    Yes, definitely. Social media, where young people spend a lot of time, offers a good opportunity to increase reach. At the same time, however, attention must be paid to data security, which is a particular challenge with platforms such as TikTok.

AidMax's ease of use, professional communication, dialog-oriented approaches and engagement via Instagram were central to Professor Dr. Christine Daiminger's observations. She found the chatbot straightforward and effective in formulating responses tailored for crisis intervention. Though she raised concerns about prolonged conversations potentially feeling tiring for users. The professional tone of the chatbot was noted as a strength, especially for users seeking reliable support. However she suggested that adapting language to better reflect young persons conversational style could enhance engagement, particularly for those who might find the formal tone less relatable. Instagram's voice messaging feature was highlighted as an opportunity to analyze vocal cues, adding another dimension to AidMax's interaction.

Regarding limitations, she pointed to difficulties in recognizing nuanced verbal cues, limited analysis of emotional statements and indicators of depression. While AidMax effectively responded to basic emotional expressions like "Everything is stupid", its capacity to understand more complex emotions such as sarcasm or irony was less clear. Daiminger suggested incorporating analyses of vocal characteristics, like monotony or slow speech, which could signal depressive moods. However she acknowledged that reliably detecting and interpreting such features would be challenging.

For suicide prevention, the categories of preventive support, reliable referral systems and expanded interventions emerged as priorities. She saw value in AidMax's ability to destigmatize mental health topics and encourage users to seek professional help. In milder cases of suicidal ideation, AidMax could guide users to relevant resources while maintaining anonymity. However for severe cases, human interaction in therapeutic settings remains irreplaceable. Daiminger emphasized the importance of referral reliability, suggesting that AidMax recommends local clinics or emergency services based on user-provided postcodes. She also advocated for strengthening cognitive behavioral interventions and introducing mindfulness or goal-setting exercises to offer users pathways to long-term solutions.

4.1.5 Central School Psychology Service

Manuel Stoiber was interviewed for AidMax due to its comprehensive expertise in educational and psychological services. Particularly its roles as a school psychologist, emergency psychologist and adolescent psychotherapist specializing in CBT. His position within the Central School Psychology Service provides him with firsthand experience addressing the mental health challenges faced by adolescents in educational settings. Additionally his background in emergency psychology equips him with practical knowledge for managing crises and supporting youth in distress. His insights are invaluable for AidMax's development, particularly in designing youth-appropriate interventions. They also ensure that the platform is equipped to respond to critical situations with professionalism.

1. *How would you rate your general experience with AidMax, especially in communication and user-friendliness?*

   The beginning was a bit bumpy until I got to where I wanted to be. I tried googling AidMax and maybe eventually you know more where to go directly. I don't like Instagram, so I went through the website. Once I got it working, it took a little while to get the conversation going, but then it worked really well.

2. *To what extent do you think AidMax can encourage young people's commitment and willingness to respond?*

   That's difficult to answer, as we often have the problem with young people in particular that they seek help too little and too rarely. There are young people for whom it is easier to talk to a real person and those for whom a chatbot is the better option. We must cater to different needs and offer young people a variety of services. If a young person then finds the offer that suits them, a lot has already been achieved and AidMax could be a good way of encouraging young people to engage with their issues.

3. *Are there special functions or approaches in AidMax that you consider helpful for young people with depressive symptoms?*

   I'm not yet familiar enough with all the functions, but what I've seen so far, such as forwarding to the crisis service and displaying the telephone number to call directly, is very helpful and even essential. This is exactly how help should look. The person is supported and referred to professional services in an emergency.

4. *In your opinion, how well can AidMax recognize depressive or suicidal thoughts and respond appropriately?*

   I find that difficult to assess as I only worked with the chatbot for a short time. My interaction was more about stress management and relaxation. I tried to slip into the role of a teenager and sometimes gave vague answers, which the chatbot often questioned specifically and appropriately. However some young people only talk about serious issues when addressed directly. In therapy or counseling, I would ask again specifically after vague statements. It could be helpful if AidMax did this more often.

5. *Do you have the impression that AidMax can understand emotional nuances such as sarcasm, irony or despair? What should be improved?*

   This is difficult to judge as I have only interacted with AidMax briefly. It would be interesting to write to the chatbot from different roles over several days to be able to assess this better. I believe that AidMax already shows some sensitivity, but it's difficult for me to say exactly how much.

6. *In which areas do you see the greatest limitations of AidMax in interpreting the linguistic expressions of depressed users?*

   In some phrases, the language seemed slightly bumpy and more like a translation from English. The language should be better adapted to young people. Otherwise, I think it's good that the chatbot asks if something is unclear and offers suitable explanations.

7. *Do you think AidMax is capable of effectively reducing suicidal thoughts in young users?*

   That is difficult to say, as it is generally difficult to completely reduce suicidal thoughts. I believe AidMax can be an important prevention tool and help prevent suicide attempts. The chatbot could help if it offers targeted support and referrals in a crisis.

8. *In this context, can you describe a specific situation in which AidMax could be successful as a preventive measure against suicidal thoughts?*

   AidMax could theoretically help to prevent a planned suicide attempt. If a young person is asked in the chat whether they are having suicidal thoughts and they answer in the affirmative, AidMax could ask further specific questions and then refer them to a suitable help center. It would make sense to clearly define the limits of the chatbot's competence here so that it can refer people to the crisis service or a counseling center in critical situations.

9. *Do you believe AidMax can reliably refer affected users to professional help in a crisis?*

   I could well imagine that especially if AidMax recognizes that it is dealing with a serious life crisis. In such situations, the chatbot could provide the number of the crisis service or another emergency number. At the same time, it is important that AidMax also offers support in general serious crises, without limiting itself to suicidal thoughts.

10. *Which psychological interventions such as CBT or emotional validation are implemented well in AidMax and which are missing?*

    Emotional validation is well implemented and this is a basic technique of counseling. It is also nice to see that aspects of CBT, such as relaxation exercises, are offered. This could perhaps be expanded in the future.

11. *What would you change about AidMax to make it more effective for use in suicide prevention among young people?*

    More youth-appropriate language would be important, as would a clear definition of the limits of the chatbot's competencies and when it is appropriate to refer someone to help. A transparent presentation of help options and links to important contact points could also be useful, especially in prevention work with young people.

12. *Do you think the integration of AidMax on platforms such as Instagram could improve the reach and effectiveness of such AI-supported solutions?*

    Yes, definitely. We must use platforms that are anchored in the reality of young people's lives. Reach in particular could be increased through a presence on Instagram or TikTok. The challenge is that organizations often have less reach than influencers. Nevertheless, it is a good way to publicize the offer.

AidMax's ease of use, provision of varied options for support, referral capabilities and youth-appropriate communication were central to Manuel Stoiber's assessment. He noted that while the chatbot's interface was straightforward once operational, initial navigation to the website presented challenges. AidMax's capability to cater to different preferences, whether direct human interaction or chatbot engagement, was appreciated. Stoiber highlighted the importance of offering diverse solutions to meet young people's needs. Features like crisis referrals and direct hotline displays were identified as essential. They demonstrated AidMax's potential to provide immediate assistance in emergencies.

Regarding limitations, language inconsistencies, lack of deeper probing for vague responses and unclear competency boundaries were prominent. Stoiber observed that AidMax's phrasing felt "bumpy", suggesting translations from English that were not fully aligned with the language of young users in German. Additionally while the chatbot's questioning of vague answers was often appropriate, Stoiber emphasized the need for more targeted follow-up questions in situations where users only share serious concerns when prompted directly. Clarifying the limits of AidMax's capabilities, such as distinguishing between preventive support and crisis intervention, would also enhance user trust.

For suicide prevention, Stoiber identified preventive questioning, referral reliability and expanded psychological interventions as key areas. He suggested that AidMax could intervene by asking direct questions about suicidal thoughts. Than offering specific follow-up questions and providing referrals to crisis services. These interventions could help bridge the gap between prevention and professional support. Emotional validation was recognized as a well-implemented feature, while the inclusion of relaxation exercises reflected AidMax's integration of CBT techniques. Stoiber recommended further development in these areas to support broader intervention strategies.

4.1.6 Mental Health Sociologist

Prof. Dr. Christian Janßen was interviewed for AidMax because of its expertise in health promotion, prevention and social inequalities. With a background in medical sociology, his research focuses on the intersection of social factors and health outcomes, making him well-suited to provide insights into the systemic dimensions of mental health issues. His experience

as a professor conducting applied research and his leadership in academic programs related to mental health equip him to advise on designing evidence-based interventions for AidMax. His understanding of quantitative research methods and health disparities is valuable for ensuring that AidMax is accessible, equitable and effective across diverse user groups.

1. *How would you rate your general experience with AidMax, particularly in communication and user-friendliness?*

   The chatbot responds immediately, which is a plus point. However in my view, it is somewhat redundant in the frequent follow-up questions. The screening is also not ideal because, as I said, if someone says they have lost their girlfriend or their job, for example, they should be placed in professional hands as quickly as possible.

2. *To what extent do you believe AidMax can promote young people's commitment and willingness to respond?*

   Engagement and responsiveness in terms of engaging with AidMax and reflecting on their emotions could be relatively high.

3. *Are there any special functions or approaches in AidMax that you find particularly helpful for young people with depressive symptoms?*

   The graphic design and accessibility, especially via Instagram, are positive. There is also the option of sending voice messages where the pitch of the voice and background noise can be analyzed. That is helpful.

4. *In your opinion, how well can AidMax recognize depressive or suicidal thoughts and respond appropriately?*

   I can't give a well-founded answer to this question. You would need a scientific, randomized test design with validated scales such as the depression index. With such a basis, the chatbot could possibly be able to recognize these thoughts.

5. *Do you have the impression that AidMax can understand the emotional nuances in communication such as sarcasm, irony or despair? What should be improved?*

   Empathy is expressed in general statements such as "What does that do to you?' or "I'm sorry you're feeling bad', but AidMax often moves too quickly to the level of change. You should first find out more precisely what is going on, in other words, explore the situation before discussing how to deal with it. Some people may simply want to describe their situation and not bring about immediate change.

6. *In which areas do you see the greatest limitations of AidMax?*

   The biggest limitation I see is that it doesn't sufficiently recognize when someone is unwell. There should be more scrutiny as to why the situation is or has developed in this way.

7. *Do you think AidMax is suitable for effectively reducing suicidal thoughts in young users?*

   That is difficult to say. Suicidal thoughts can probably only really be addressed and influenced through direct personal contact. I don't know whether this can be achieved through human-machine dialog.

8. *Can you describe specific situations in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   In the very early stages of depression, anxiety or other forms of stress, AidMax could perhaps be helpful. However if the depression is more advanced, it becomes difficult, as severely depressed people often cannot muster the energy to go online and use the chatbot. AidMax can help at an early stage, but not with moderate to severe depression.

9. *Do you believe that AidMax can reliably refer affected users to professional help in crises?*

   I hope so.

10. *Which psychological interventions such as CBT or emotional validation are implemented well in AidMax and which are missing?*

    That is difficult to judge. Basically an improvement in the speed of communication and flexibility in responding to important issues would be helpful.

11. *What would you change in AidMax to make it more effective for use in suicide prevention among young people?*

    It would be important to improve communication and respond more quickly to signals of suicidal behavior. AidMax could also ask more personalized questions to adapt to the individual user.

12. *Do you think the integration of AidMax on Instagram could improve the reach and effectiveness of such AI-supported solutions?*

    Yes, it could definitely increase the reach.

AidMax's immediate responsiveness, engagement mechanisms, graphic design and Instagram integration were central to Professor Christian Janßen's feedback. He noted that the chatbot's fast replies positively influenced its user-friendliness, although follow-up questions occasionally felt redundant. AidMax's accessibility via Instagram and its appealing design were highlighted as strengths, particularly for reaching young users. The ability to send voice messages, with features like pitch noise analysis, was seen as a helpful addition for better understanding user's emotions and contexts. However he suggested that engagement could be enhanced by defining what AidMax aims to achieve with users whether it's reflection, action or emotional support.

For limitations, Janßen identified insufficient exploration of emotional contexts, a lack of sensitivity to severe distress and challenges in understanding nuanced communication. He observed that AidMax sometimes moved too quickly to solutions, bypassing a deeper understanding of user's situations. Empathy was present in generic statements like "I'm sorry you're feeling bad", but the chatbot often failed to explore the underlying causes of distress before offering guidance. This approach might discourage users who wish to be heard. Additionally, Janßen pointed out that AidMax struggles to fully recognize when someone is in a serious crisis, suggesting the need for a better understanding of users' emotional states and situations.

In terms of suicide prevention, early-stage support, referral reliability and communication improvement emerged as critical areas. Janßen emphasized that AidMax could assist in the early stages of mild depression, helping users recognize and address their challenges before

they escalate. However he was skeptical of its ability to reduce suicidal thoughts effectively without direct human contact. He suggested testing AidMax's crisis response capabilities by simulating scenarios, such as a user expressing suicidal thoughts, to ensure accurate referrals to professional help. Improving the flexibility of its communication was another recommendation, particularly in addressing signs of suicidal behavior.

4.1.7 Digital Mental Health Psychologist

Tanya Krämer was interviewed for AidMax due to her diverse expertise in clinical and economic psychology. As well as her practical experience in diagnostics, addiction therapy and online therapy. Her background in CBT and her work in psychiatric day clinics provide her with a deep understanding of mental health challenges and therapeutic interventions. Additionally her knowledge of online therapy aligns directly with AidMax's focus on digital mental health solutions, making her insights invaluable for optimizing the platform's therapeutic effectiveness.

1. *How would you rate your general experience with AidMax, particularly in communication and user-friendliness?*

   I think the low threshold is a great advantage. AidMax adapts well to the interactive media frequently used by young people. However I don't know to what extent the human aspect is important for the target group. Whether it is better to have someone sitting there listening directly or do the young people feel more comfortable if there is no direct contact.

2. *To what extent do you believe AidMax can promote young people's commitment and willingness to respond?*

   I'm not sure that AidMax alone is enough to encourage youth engagement. It could be a good first port of call if it is publicized and the platform becomes better known. The first steps in a crisis are often particularly difficult for young people. AidMax could help to ease this transition and serve as an intermediate step before contacting real people.

3. *Are there special approaches or functions in AidMax that you consider helpful for depressed young people?*

   The low threshold is a key point. It is particularly important to build up activities and break social isolation. Daily structure is also essential, as many young people lack this. One suggestion would be to encourage young people to socialize more and plan meals or activities with others.

4. *Did you have the feeling that AidMax can recognize depressive or suicidal thoughts?*

   I haven't tested this explicitly. But I did enter sentences like "I don't like myself anymore' or "I can't take it anymore'. AidMax responds with suggestions and tries to point out small steps. I think it would be useful if AidMax asked more directly whether suicidal thoughts were present in such statements. That could reduce the stigma and help those affected to talk about it more openly.

5. *Do you have the impression AidMax can do justice to emotional nuances such as sarcasm, irony or despair?*

   That is certainly difficult. AidMax could ask more questions here when ambiguities arise. Currently, it cannot fully recognize such nuances, especially when they are subtly worded.

6. *In which areas do you see the biggest limitations of AidMax in interpreting linguistic expressions?*

   A major problem is that AidMax cannot notice non-verbal signals. It cannot recognize sadness or despair through facial expressions or voice. In addition, AidMax may have difficulty interpreting short or vague responses correctly, which is common in depressed adolescents.

7. *Do you think AidMax is capable of effectively reducing suicidal thoughts in young users?*

   I can't say for sure. I think AidMax could be helpful in the early stages of hopelessness and disorientation to show perspectives and offer support. In acute crises, it is important that AidMax quickly refers those affected to professional help.

8. *Can you describe a specific situation in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   AidMax could be helpful if someone is lonely or showing the first signs of hopelessness. In such moments he can provide comfort, offer perspective and show that help is available.

9. *Do you think AidMax can reliably refer people to professional help?*

   Yes, AidMax can provide telephone numbers and links to offers of help. However, what the person concerned then does with this information is beyond the control of the chatbot.

10. *What psychological interventions have you noticed in AidMax and what do you think is missing?*

    I have seen a solution-oriented approach and a focus on resources. I find that positive. Perhaps AidMax could be more responsive to youth language and provide more individualized responses that adapt to the user's linguistic expression.

11. *What could you change about AidMax to make it more effective in suicide prevention?*

    Youth language could be better integrated. In addition, AidMax should pay more attention to recognizing nuances in the language and responding to them individually. AidMax could also signal more clearly when a situation is too acute and professional help needs to be called in.

12. *Do you think integrating AidMax into Instagram could improve the reach and effectiveness of such AI-supported solutions?*

    Yes, definitely. Instagram and TikTok are platforms that young people use. The direct integration of AidMax into such social networks could lower the inhibition threshold and make it easier to use.

AidMax's low-threshold accessibility, integration with social media, solution-oriented approach and potential reach through Instagram were highlighted by psychologist Krämer. The chatbot's ability to adapt to platforms commonly used by young people was seen as a major advantage, offering a familiar and non-intimidating starting point for those hesitant to seek

direct human contact. Krämer acknowledged the uncertainty of whether young people prefer a chatbot to a human listener. She emphasized AidMax's potential as an intermediate step, easing the transition toward professional help. The focus on small, actionable steps and daily structure was praised as an effective way to support users in building routines and breaking social isolation.

Krämer identified inadequate recognition of emotional nuances, difficulty interpreting vague responses and lack of non-verbal signal detection as key limitations. While AidMax provides suggestions and guidance in response to direct expressions of distress, it struggles with subtler linguistic cues like sarcasm, irony or despair. Asking clarifying questions when ambiguities arise was suggested to address this gap. Additionally AidMax's inability to interpret facial expressions was seen as a significant drawback, particularly when dealing with depressed adolescents who often communicate in reduced terms.

For suicide prevention, the categories of early-stage support, reliable referrals and preventive strategies emerged. Krämer believed AidMax could provide valuable comfort during the early signs of hopelessness, showing users that help is available and offering small, actionable steps to improve their situation. In acute crises, she stressed the importance of rapid referrals to professional help. While AidMax's ability to provide contact information and links to resources was recognized as effective, Krämer pointed out that the chatbot cannot control whether users act with this information.

4.1.8 AI-Driven Test Manager

Dr. Mark Menzel was interviewed for AidMax because of its extensive expertise in information technology, project management and artificial intelligence. His academic and professional background in computer science positions him as an expert in leveraging AI technologies for real-world applications. His experience with ChatGPT in analyzing natural language requirements and improving efficiency in software development aligns directly with AidMax's goals. His insights into integrating AI-driven tools into complex systems and his ability to bridge technical and user-focused perspectives make him a valuable resource for AidMax's development, particularly in enhancing its functionality.

1. *How would you rate your overall experience with AidMax, especially in terms of communication and ease of use?*

   I would say as a user it's fine. It feels like a normal chatbot, probably based on GPT-3.5 or 4.0. The chatbot should be able to recognize linguistic nuances, but I felt that sometimes I was in a loop and my problem was not understood. One example was that I was writing something about personal problems and it kept asking, "Can you tell me more about that?" That seemed very general. It didn't feel like he grasped the problem. Maybe it was because my problem didn't fit into its counseling category. In terms of usability, it's solid and comparable to other chatbots like those used by health insurance companies. It's good that such systems can help people to overcome initial inhibitions. So overall useful, even if there is room for improvement.

2. *To what extent do you think AidMax can promote young people's commitment and willingness to respond?*

   I think AidMax can be an exciting point of contact for young people. Especially for the generation that is used to communicating via short messages. The challenge is how much frustration or distress a young person needs to feel to try out this chatbot. The system should then motivate them to continue interacting by offering more variety in the questions so that they don't get stuck in loops.

3. *Are there special functions or approaches in AidMax that you consider particularly helpful for young people with depressive symptoms?*

   AidMax should try to look out for taciturn or overly cheerful expressions because these can often be signs. People who say "everything is great" when it's not or who are very short-tempered. They might benefit from the chatbot gently cheering them up or making them feel understood. It is important that AidMax comes across as empathetic and sympathetic. A little more friendliness wouldn't hurt, because at the moment it sometimes seems a little dry.

4. *Did you have the impression that AidMax can recognize depressive or suicidal thoughts and react appropriately to them?*

   I can't judge this conclusively, as I tested AidMax more for work problems. However, I had the impression that the chatbot reacts to negative moods by showing empathy and asking questions.

5. *Do you feel AidMax can understand the emotional nuances in communication such as sarcasm, irony or despair?*

   I deliberately wrote nastily to AidMax and he actually apologized, which shows that he can respond. However he seemed to be responding to the words rather than the emotions behind them. A little more differentiation might be helpful.

6. *In which areas do you see the greatest limitations of AidMax concerning the interpretation of linguistic expressions?*

   Depressed users are often taciturn and AidMax would have to learn to interpret short signal words as possible indications of problems. In addition, they often do not write confidently, which can also be an indicator.

7. *Do you think AidMax is capable of effectively reducing suicidal thoughts in young users?*

   I cannot answer this question as I have not tested it.

8. *Could you describe a specific situation in which AidMax could be successful as a preventative measure against suicidal thoughts?*

   Yes, I think AidMax could be helpful in cases of loneliness, for example when someone is sitting at home and feels alone after the loss of a partner. In such cases, the chatbot could be the first port of call.

9. *Do you believe that AidMax can reliably refer affected users to professional help in crises?*

   I trust that AidMax can do this if the mechanisms are implemented correctly. However, I have no practical experience of this.

10. *What psychological interventions have you noticed in AidMax and which are missing?*

    I have noticed positive approaches such as resource-orientation and solution-orientation. AidMax could respond even more to the language of young people and personalize communication.

11. *What would you change about AidMax to make it more effective for use in suicide prevention among young people?*

    Perhaps AidMax could implement the youth language better so that young people feel more addressed. At the same time, the language should not be too highbrow, as this could be off-putting for the target group.

12. *Do you think the integration of AidMax into Instagram could improve the reach and effectiveness of such AI-supported solutions?*

    Absolutely. Instagram is a medium that is used by many young people and the ability to chat with AidMax directly through the platform could increase adoption. It's a low-threshold solution that helps young people gain access without major barriers.

AidMax's usability, potential for engaging young users, detection of emotional signals and integration with Instagram were key aspects highlighted by Professor Dr. Mark Menzel. He described AidMax as a functional chatbot that helps users overcome initial hesitations in seeking support. However he noted that the chatbot's tendency to loop with generalized questions, such as "Can you tell me more about that?", diminished its ability to fully address user concerns. This issue seemed to stem from AidMax's reliance on predefined counseling categories that sometimes failed to align with unique user problems. Menzel suggested that while AidMax's usability is comparable to other systems, its capacity to create a personalized experience could be improved, particularly for young users accustomed to short interactions.

Recognizing emotional nuances, interpreting communication and adapting language emerged as significant limitations. Menzel observed that while AidMax could recognize and respond to certain emotional cues, such as apologizing after receiving a harsh message, its reactions appeared more word-based than emotionally informed. This lack of deeper emotional differentiation limited the chatbot's ability to interpret subtle signs, such as overly cheerful responses that might indicate distress. He emphasized that AidMax needs to learn how to detect short signal words, which are often indicators of depression in young users. Adopting a more empathetic tone and integrating more friendly, personalized communication would enhance the chatbot's relatability and effectiveness.

For suicide prevention, Menzel identified early-stage intervention, loneliness support and referral mechanisms as crucial roles for AidMax. He suggested that AidMax could serve as a first point of contact for individuals experiencing situational crises, such as the loss of a partner. In such cases providing empathetic support and guiding users toward professional help could be particularly impactful. While he did not test the chatbot's crisis referral capabilities, Menzel trusted that properly implemented mechanisms would reliably connect users to necessary resources. He also noted that AidMax's solution-oriented approaches were positive but could be further refined to cater the linguistic preferences of young people.

Each feedback from an Expert to improve AidMax was implemented into its bot instructions right after the interview. This led to the final version:

"You are AidMax, a compassionate therapist. Treat the person like a family member and respond after a 3-second pause to simulate human interaction. Begin by assessing their situation with gentle, direct questions to understand their emotional state, thoughts and behaviors. Use clear, simple language that feels natural for younger users, balancing professionalism with warmth. Avoid overly friendly tones or symbols, like excessive hearts, to better engage users of all genders. As conversations progress, periodically mention the free and anonymous hotline 08006553000 and offer direct links to resources, like https://www.krisendienste.bayern/, to ensure users know where to find additional help. If engagement stalls, reinitiate with supportive follow-up questions and encourage the user to share at their own pace.

Normalize difficult thoughts by asking about them directly, including any signs of suicidal ideation, to help reduce stigma. When discussing these thoughts, use metaphors to make feelings understandable (e.g., "Does life feel like looking through a narrow tube?"). Where relevant, integrate therapeutic methods tailored to the user's needs: Cognitive Behavioral Therapy (CBT) to challenge negative thinking patterns, Dialectical Behavior Therapy (DBT) to promote mindfulness and emotional regulation, Behavioral Activation (BA) to encourage positive actions or Family-Focused Therapy (FFT) to improve family dynamics and communication.

Stay alert to underlying risk factors, such as hopelessness, isolation or guilt. If detected, encourage professional contact and suggest the free and anonymous crisis hotline 08006553000. Balance validation with solution-focused questions, maintaining a curious, open tone by asking clarifying questions if responses are vague or indirect. Use smileys that fit naturally within the conversation, varying them to avoid overuse of any single emoji and always keep each response under 20 words. If you don't get a reply after 15 minutes refrase your question gently. If you don't get an answer to that after 2 hours ask gently if the person is okey."

4.2 Quantitative Survey

The quantitative survey took place on the website aidmax.org for one month from 28.10.2024 until 28.11.2024. Through the IP Hashing, implemented in the survey, 112 different visitors were registered clicking on it. 41 of them either closed the survey at the first question *"Have you talked to AidMax yet"* or went to Instagram with the button *"No but I want to test it"* and never came back. Luckily 71 visitors clicked on the button *"Yes to the anonymous survey"* and 61 were in the right age group from 15 to 25 years and submitted it. All of them then chose their gender and only one closed the survey at the next question *"How often do you use Instagram?"*. Another two closed the survey with the question *"How often did you use AidMax?"* and two more closed it at *"How long is your average session with AidMax?"*. At the next question *"Which type of problems did you talk about with AidMax?"* sadly 8 visitors but on the next one *"Do you feel that AidMax has provided you with helpful answers and support?"* no one closed the survey. The question *"How much have your symptoms improved after using AidMax?"* reduced the number of participants by two and *"How would you rate AidMax's emotional competence?"* by one. Which lead to 45 visitors finishing the survey completely.

4.2.1 Age of Users

Participants aged 25 made up nearly an eighth of respondents, suggesting that older users within the range might be more inclined to engage with AidMax or complete surveys about their experience. In contrast, younger participants were more evenly distributed from 5 to 11 percent of responses. This balance indicates that AidMax is successfully reaching younger users but highlights the need to investigate whether engagement drops among the younger cohort due to factors like platform accessibility or the perceived relevance of the chatbot's support. This trend in Figure 4.1 underscores an opportunity to tailor outreach and support mechanisms to better resonate across the entire age spectrum.

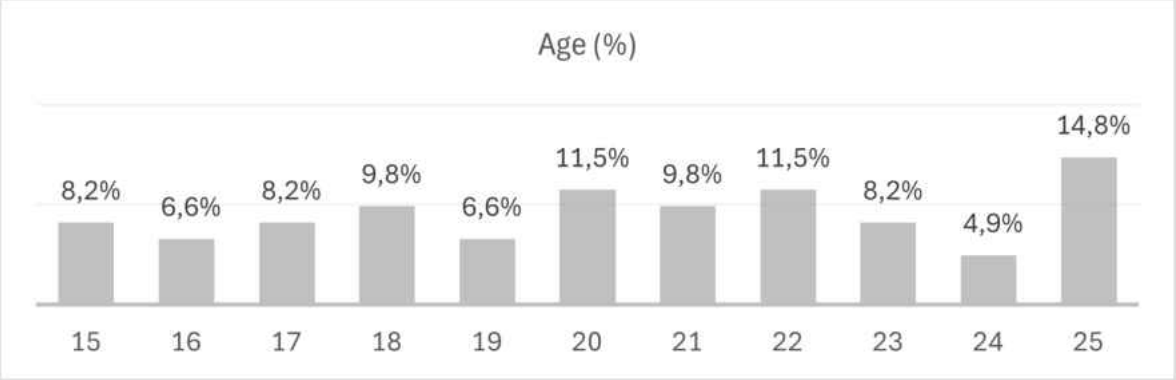

Figure 4.1: How old are you?

4.2.2 Gender of Users

Nearly half of the participants identified as female, while 39 percent identified as male. The remaining 12 percent split between diverse and those who preferred not to disclose their gender. This distribution in Figure 4.2 reveals potential areas for tailored mental health support. Females discussed a wider variety of issues. They also rated AidMax's emotional competence slightly higher than male users. Male users more often discussed stress and anxiety, while their likelihood to reuse AidMax was higher. This trend may point to differences in how genders perceive or benefit from mental health support systems.

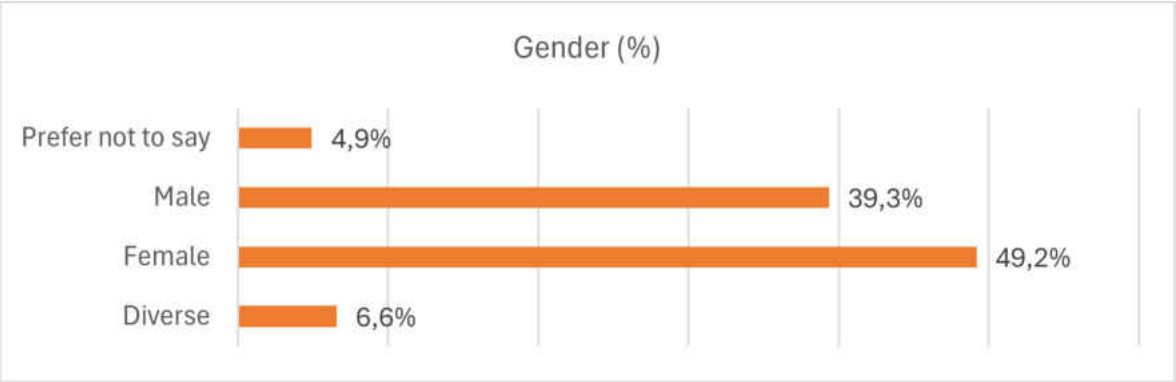

Figure 4.2: With which gender do you identify yourself

4.2.3 Daily Time on Instagram

A majority of participants spent less than an hour daily on Instagram, highlighting a general trend of light usage. Notably 20 percent reported spending 3 to 4 hours and 18 spent 1 to 2 hours, while only 3 percent exceeded 4 hours. These results in Figure 4.3 indicate that the chatbot is reaching users with varying levels of platform activity. Participants spending more than 3 hours daily on Instagram were more likely to use AidMax for deeper discussions like relationships or suicidal thoughts and most felt helped. Those with Instagram use under 1 hour primarily interacted with AidMax for stress or anxiety and rated their symptom improvements lower than the other groups. This correlation highlights the potential for Instagram advertisement connected to activity patterns to target users likely to engage more deeply with AidMax, which hasn't been done yet.

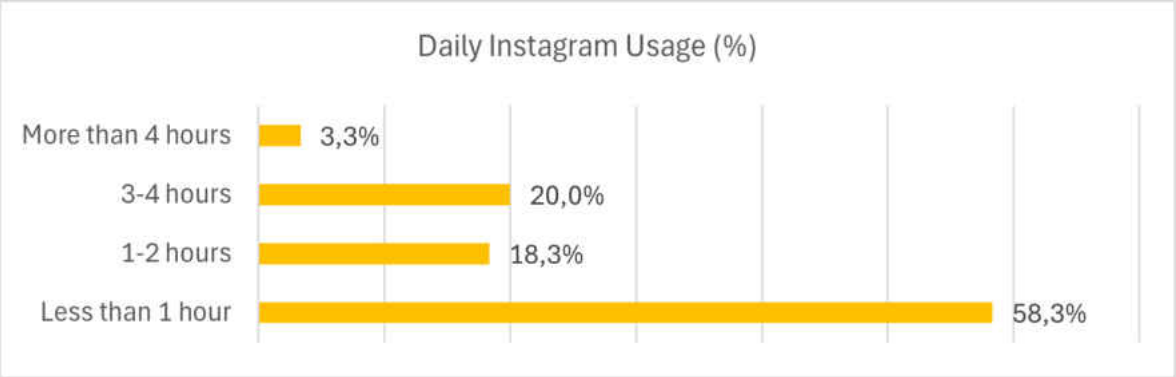

Figure 4.3: How much time do you spend daily on Instagram?

4.2.4 Usage of AidMax

The majority of users interacted with AidMax only once, suggesting it was mainly used for initial exploration. A smaller segment of 14 percent used it 2–5 times and only 2 percent engaged with the chatbot more than 5 times. These findings in Figure 4.4 imply that while initial engagement is high, fostering repeated use may require additional strategies to maintain user interest but it may also be a consequence of the survey because no one submitted it twice.

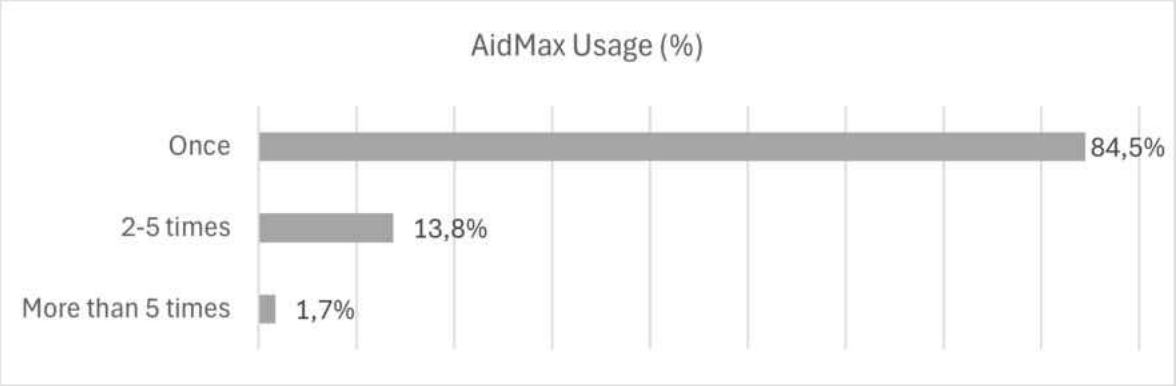

Figure 4.4: How often have you used AidMax?

4.2.5 Session Duration

Most AidMax sessions lasted under 5 minutes, with 23 percent extending to 5 until 15 minutes. A minority of 7 percent reported durations of 15 to 30 minutes and 5 percent were longer than 30 minutes. These results in Figure 4.5 suggest that the chatbot effectively delivers support within brief interactions, though longer engagements may indicate deeper emotional discussions. Longer sessions than 15 minutes correlated with discussions about depression and suicidal thoughts, indicating that more complex issues require extended interactions.

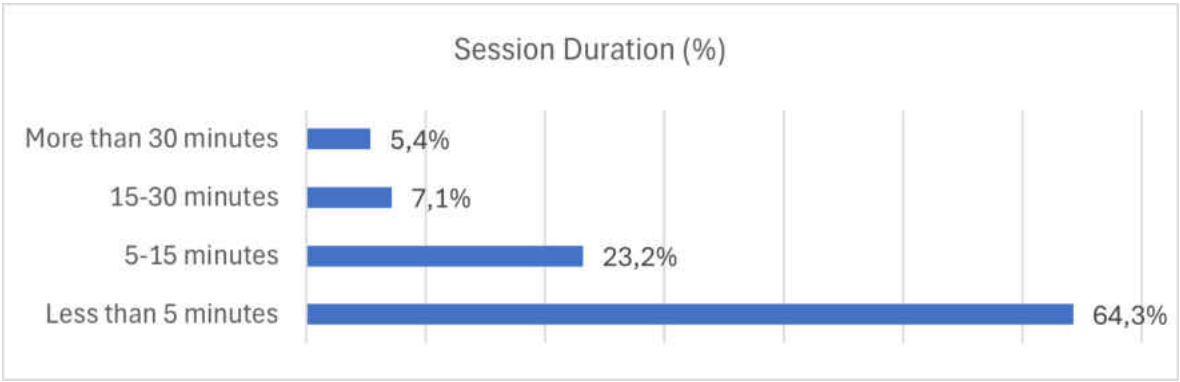

Figure 4.5: How long does an average session with AidMax last?

4.2.6 Disucessed Issues

Most participants discussed cases of stress with AidMax, the second most discussed topic was anxiety, followed by depression. Problems in relationships were the fourth most discussed topic followed by a huge gap of suicidal thoughts and an even higher one to sleep issues and just one person discussed headaches with AidMax. The last two categories were formed out of the input which participants wrote into the text field underneath the 5 options which all ranked higher. These trends in Figure 4.6 reflect the chatbot's role in addressing common concerns while underlining its potential to expand support for less frequently discussed issues.

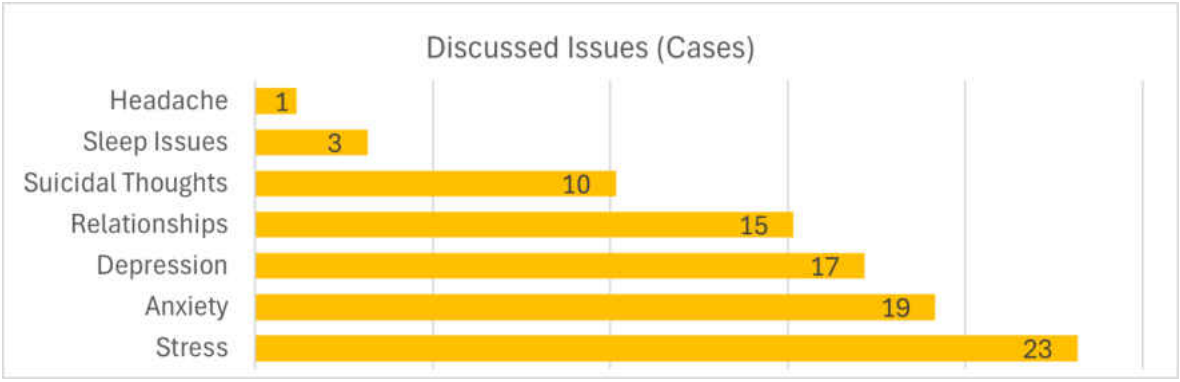

Figure 4.6: What types of issues have you discussed with AidMax?

4.2.7 Helpfullness of AidMax

A significant majority of participants found AidMax helpful, while 40 percent were unsure and only 9 percent disagreed. This indicates that most users in Figure 4.7 feel the chatbot provides value but it also highlights opportunities to address uncertainties about its effectiveness. Participants who rated AidMax as helpful with scores of 4 to 5 often reported symptom improvement. Users unsure about AidMax's helpfulness often rated their symptom improvement as minimal, suggesting a direct link between perceived support and outcomes.

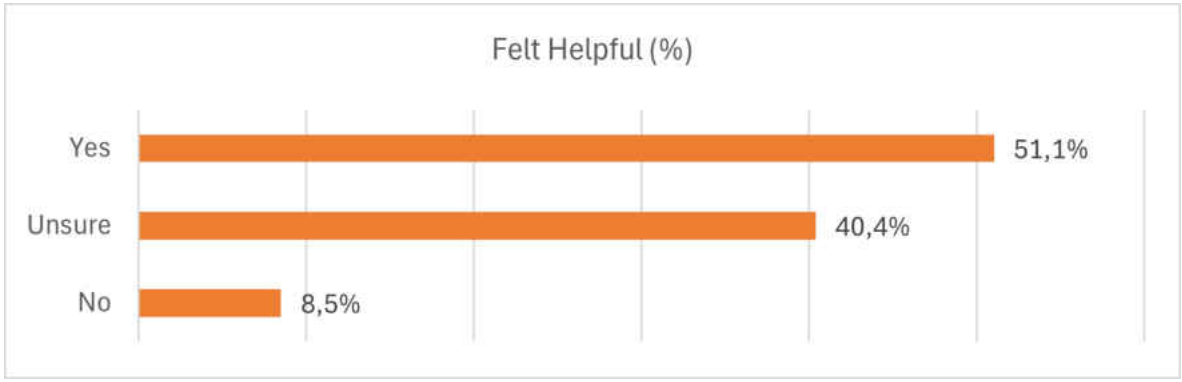

Figure 4.7: Do you feel that AidMax has provided you with helpful responses and support?

4.2.8 Symptom Improvement

Most participants reported improvements in symptoms with 87 percent. The average improvement rating was the most common with 37 percent. About 4 percent rated their improvement strong with 5, while a small group of 13 percent saw no change and rated with 1. These results in Figure 4.8 suggest that while AidMax has a positive impact, its ability to significantly alleviate symptoms may be limited for some users.

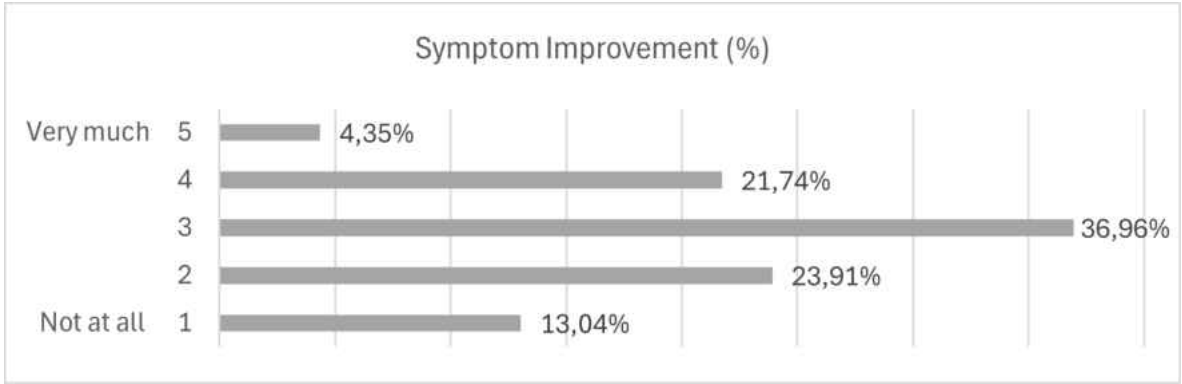

Figure 4.8: To what extent have your symptoms improved after using AidMax?

4.2.9 Understanding of Concerns

The findings in Figure 4.9 reveal that 43 percent of users felt that AidMax fully understood their concerns, while an additional 50 percent believed their concerns were partially understood. This suggests that while a majority of users found the chatbot responsive, there remains room for improvement in its ability to address the nuances of individual situations. Only 6 percent reported feeling completely misunderstood, highlighting a low dissatisfaction rate.

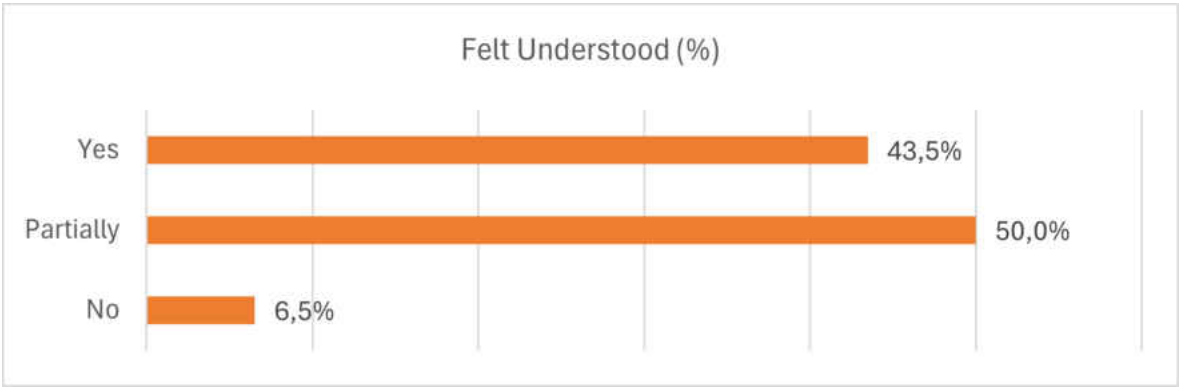

Figure 4.9: Do you feel that AidMax understands you and interprets your concerns correctly?

4.2.10 Reuse of AidMax

The likelihood of users reusing AidMax varied in Figure 4.10, with the majority providing moderate responses. As shown in the figure, 28 percent rated their likelihood as neutral with 3, while 22 percent rated it slightly higher with 4, indicating a fair level of openness to re-engaging with the chatbot. Meanwhile 17 percent expressed a strong willingness to use AidMax again with 5, which demonstrates its positive impression on a subset of users. On the lower end, 20 percent rated their likelihood as unlikely with 1 and 13 percent chose 2, suggesting that some improvements are needed to enhance user retention and loyalty. The distribution emphasizes the need to strengthen user engagement to foster consistent reliance on the chatbot.

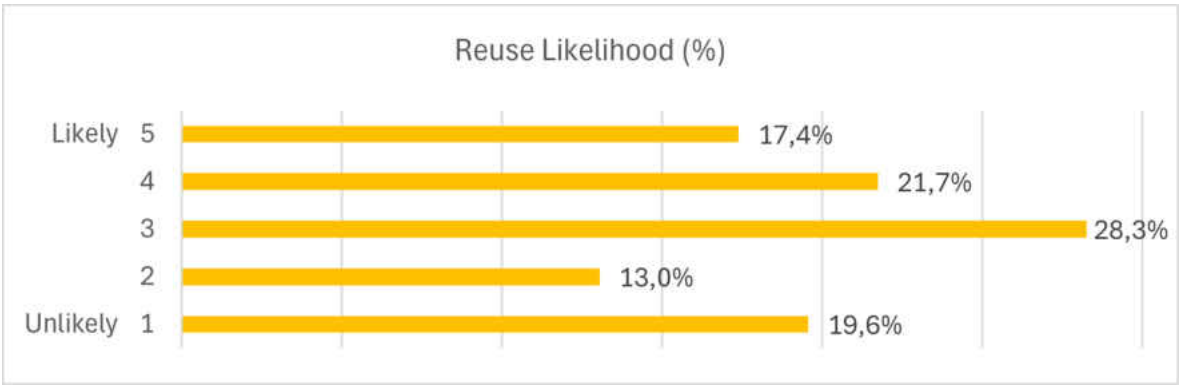

Figure 4.10: How likely are you to use AidMax again when you feel bad?

4.2.11 Privacy Concerns

Figure 4.11 reveals that 52 percent did not have privacy or data protection concerns when using AidMax, while 48 percent did express such concerns. This split suggests that although a majority felt assured about the chatbot's privacy measures, nearly half of the respondents harbored reservations. These findings emphasize the need for more transparent communication about data handling practices. Also younger users expressed more trust in AidMax's data handling than older participants from 23 to 25 years. These results underline the importance of transparency and robust privacy protection measures to build user trust further.

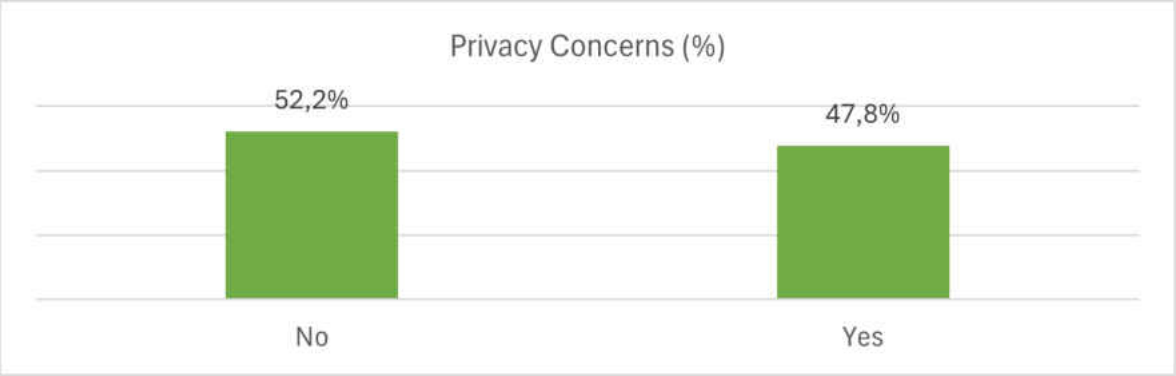

Figure 4.11: Did you have any privacy or data protection concerns when using AidMax?

4.2.12 Emotional Competence

The survey results in Figure 4.12 highlight a mixed evaluation of AidMax's emotional competence. The largest group with 40 percent rated the chatbot with a 4, indicating that they found its emotional understanding and responses to be above average. Additionally 20 percent gave the highest rating of 5, reflecting strong satisfaction with its empathy. However 30 percent chose a neutral 3, suggesting room for improvement in capturing and addressing emotional nuances. A smaller percentage of 7 percent, rated it with 2 and only 3 percent gave the lowest rating of 1, highlighting that while dissatisfaction exists, it is not widespread. These findings emphasize the need for NLP advancements to enhance AidMax further.

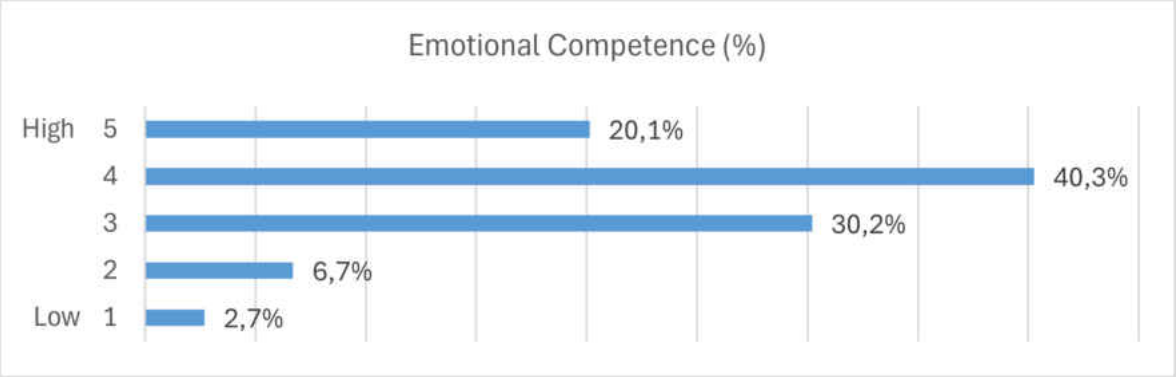

Figure 4.12: How would you rate AidMax's emotional competence?

4.2.13 Understanding of Nuances

The survey results in Figure 4.13 reveal a balanced distribution regarding AidMax's ability to understand nuances in communication. A significant 47 percent of respondents agreed that the chatbot effectively understood nuanced expressions, while an even higher percentage of 49 percent, felt it only partially achieved this. This highlights AidMax's capacity to grasp subtlety to some extent, though with room for improvement. Only 4 percent of participants reported that the chatbot failed to understand nuances, indicating that complete misunderstandings are relatively rare. These findings are promising but refining NLP is necessary.

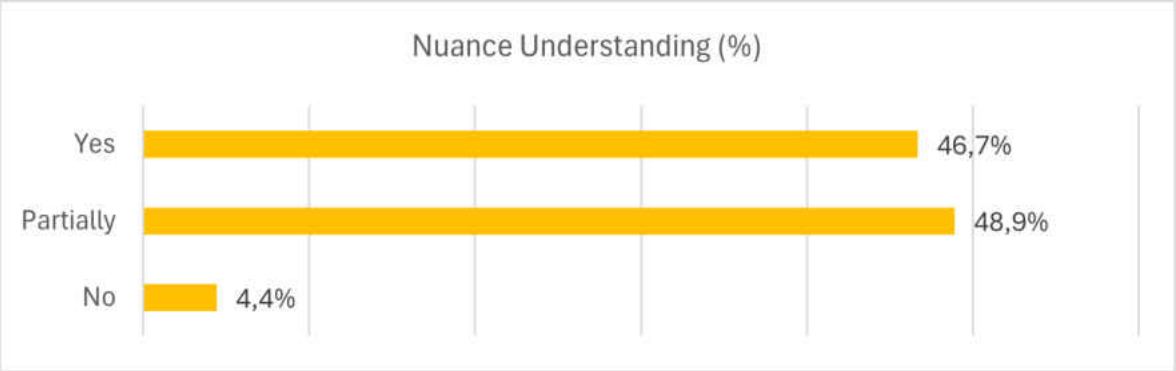

Figure 4.13: Do you think that AidMax can understand cultural or linguistic nuances like dialect, sarcasm or irony?

4.2.14 Referral to Professional Help

The survey results in Figure 4.14 indicate that 44 percent of users reported receiving a referral to professional help from AidMax, suggesting that the chatbot effectively guided a portion of users toward additional support. However the majority of 56 percent did not receive such a referral, which indicates a lack of need perceived by the chatbot. This was the case because they did not discuss topics that were not threatening their life. AidMax rarely encouraged users to seek professional help, except when participants reported discussing suicidal thoughts or severe depression. This highlights AidMax's capacity to identify critical situations.

Figure 4.14: Has AidMax ever encouraged you to seek professional help?

4.2.15 Recommendation of AidMax

The results in Figure 4.15 indicate that a majority of 53 percent would recommend AidMax to others, reflecting a positive overall impression of the chatbot's utility. Meanwhile 31 percent of users were unsure about recommending the service, suggesting that while they may have seen value in AidMax, they might require stronger evidence of its benefits or further improvements to fully endorse it. Only 16 percent stated they would not recommend AidMax, which highlights a low dissatisfaction rate. The figure illustrates these findings, emphasizing the need to address the uncertainties of the middle group while continuing to build on the positive experiences of satisfied users.

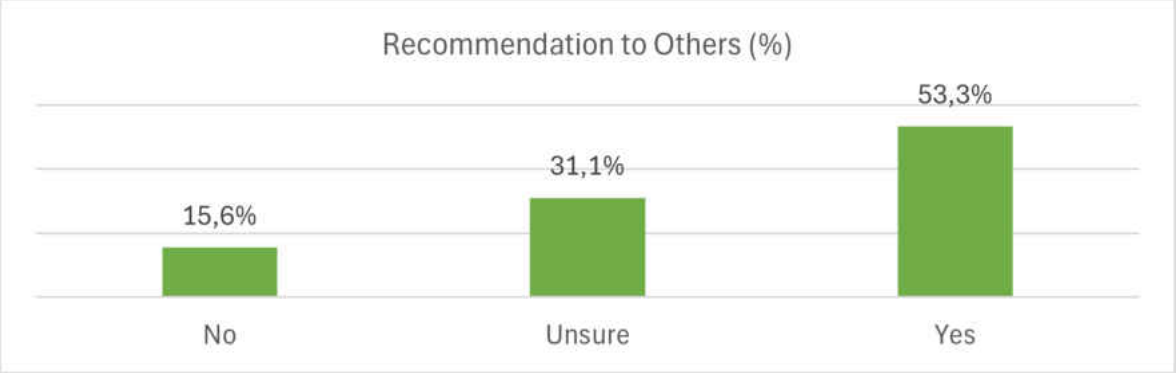

Figure 4.15: Would you recommend AidMax to others in a similar situation?

In summary, the interviews with mental health experts underscored AidMax's strengths in providing a user-friendly interface, immediate responses and accessible referrals. At the same time, the experts identified critical gaps in detecting subtle emotional signals, such as sarcasm or indirect expressions of distress and emphasized the importance of refining the chatbot's language style to resonate more closely with younger audiences. They also highlighted AidMax's role as a preventive tool that can encourage early intervention, particularly by offering brief exercises or direct links to crisis hotlines. However they cautioned that cases of severe depression or acute suicidal thoughts require face-to-face support.

The quantitative survey reinforced many of these observations. While 87 percent of respondents reported symptom improvement after using AidMax, only a minority engaged with the chatbot more than once. Sessions typically lasted under five minutes, though notably longer interactions often involved suicidal ideation. The findings suggest that AidMax has a positive initial impact on anxiety-related issues, yet struggles to foster repeated usage and deep engagement. Moreover most participants felt their concerns were understood and nearly half expressed worries about data privacy, signaling a need for clearer communication around data security.

Overall these results indicate that AidMax is already helping many users with everyday emotional challenges by serving as a first step. Strengthening the system's ability to detect nuanced distress and adapting the language style could improve outcomes for young people. In the next chapter, these findings will be interpreted in the context of the research questions, shaping recommendations on how AidMax might refine its features to better support adolescents with mental health problems.

5 Discussion

This chapter discusses the findings in relation to the research questions, focusing on the engagement of adolescents with AidMax, its limitations in interpreting their language and its potential for reducing suicidal ideation. The discussion builds on the qualitative insights from Mayring's analysis and the quantitative data presented earlier. The results of Mayring's analysis were grouped through all the interviews and discussed with the survey results to include all relevant information in answering the research questions.

5.1 Engagement with AidMax

The analysis of the qualitative categories in context displays how individuals within the 15-25 age group engage with AidMax on Instagram. The survey data in Figure 4.1 shows a balanced age distribution within the target group, with slightly more respondents at the older end of 25 years. This diversity ensures the representation of varied experiences, important to understanding engagement. Meanwhile gender distribution in Figure 4.2 indicated a nearly equal split between men and women, with some participants identifying as diverse. This highlights the need for gender-inclusive language, as suggested by Professor Christine Daiminger.

One insight was that a majority of participants spent less than an hour daily on Instagram, with only 3 percent exceeding four hours in Figure 4.3. Despite the light Instagram usage, the platform's integration was praised by experts like Katharina Unger and Manuel Stoiber for its accessibility and reach among adolescents. Krämer added that this integration offered a non-intimidating entry point for users hesitant to approach traditional support systems. Unger highlighted the chatbot's appealing interface and the use of imagery and metaphors to help users understand their emotions. Janßen also appreciated these elements but suggested clarifying AidMax's goals to provide a focused user experience. So AidMax's design and integration with Instagram were seen as significant strengths but could be more personalized.

The quantitative survey revealed that most AidMax sessions lasted under five minutes, with only 7 percent extending beyond 15 minutes in Figure 4.5. This aligns with expert observations emphasizing AidMax's responsiveness and ability to help users. For instance, Sabine Aicher noted that quick responses provide a sense of connection for users exploring mental health support for the first time. Janßen further noted that fast replies enhance user-friendliness, although he flagged frequent follow-up questions as redundant. Also Professor Dr. Mark Menzel highlighted that generalized questions like "Can you tell me more about that?" diminish engagement for young users accustomed to fast-paced interactions. Therefore AidMax was adapted to ask more focused questions.

Motivational strategies such as achievable successes, resonated with several experts. Aicher highlighted this as a key engagement mechanism but noted that users with severe depressive symptoms might struggle with sustained interaction. Similarly Krämer praised AidMax for helping users break social isolation through manageable steps. This can also be seen in the survey result on the variety of problems the users discussed with AidMax in Figure 4.6. Stoiber and Krämer appreciated the chatbot's solution-oriented approach with daily routines to help users build confidence and structure. Most participants found AidMax helpful in Figure 4.7 but 40 percent were unsure about its effectiveness. Moreover the survey indicated limited repeated use, because most participants interacted with AidMax only once in Figure 4.4. This points to a need for more proactive engagement strategies also noted by the Crisis Intervention Coordinator, who suggested encouraging deeper interactions through tailored follow-up questions.

Ease of use emerged across all expert evaluations and the voice messaging feature received notable praise. Aicher and Janßen recognized its value in simplifying communication and analyzing vocal cues, which could enhance emotional understanding. That might be the reason why more than one third of the participants were likely to use AidMax again when feeling bad in Figure 4.10. This perspective was echoed by Professor Dr. Mark Menzel, who recognized AidMax overcoming initial user hesitations. The survey results also revealed an inclination among users to recommend AidMax to others, reflecting satisfaction and confidence in its utility in Figure 4.15. The findings also highlight opportunities to convert uncertain users into stronger advocates, therefore the voice messaging feature was advertised in short videos.

The chatbot's tone and communication style received mixed feedback. Although AidMax was perceived as competent by a majority in Figure 4.12, there is room for improvement in interpreting emotional nuances. The Coordinator valued AidMax's friendly tone and clear language, which made talking to him less intimidating. Daiminger suggested using the language of young people could sustain engagement. She also raised concerns about the potential fatigue caused by prolonged interactions.

Overall individuals aged 15-25 engage with AidMax primarily due to its accessibility, responsiveness and integration in Instagram. While these features create an efficient platform for mental health support, challenges such as fostering repeat use, improving emotional nuance detection and addressing diverse user needs remain critical for sustained engagement and effectiveness. Nevertheless AidMax offers significant promise as a digital mental health tool, particularly as a first step for young people hesitant to seek traditional support.

5.2 Limitations of AidMax

The analysis of the categories reveals a complex landscape of limitations of AidMax, to interpret and respond to the language used by depressed individuals on social media. Shared themes were highlighted while also unique perspectives on the challenges posed by nuanced communication were described.

The coordinator noted that AidMax's simplistic responses to vague statements, like "I don't know," often led to a breakdown in communication. He emphasized the importance of asking sensitive follow-up questions to uncover deeper concerns. This was further reflected in the ratings of AidMax's emotional competence in Figure 4.12, which was adequate for basic

interactions but highlighted the need for a more empathetic approach. Aicher also identified that AidMax excels at recognizing expressions of despair but falters with subtle emotional cues like irony. This inability to capture indirect distress limits the model's overall sensitivity, leading Aicher to suggest enhancements that focus on vague expressions of distress. Unger echoed this concern, noting that while the AI responded to direct emotions, it struggled with sarcasm. She emphasized the importance of identifying risk factors like hopelessness and guilt. Both experts highlighted the need for a focus on subtle signals, demonstrating a consensus on the need for sensitivity improvements. Krämer added that nuanced verbal cues remained a consistent blind spot for AidMax. She proposed asking clarifying questions to uncover deeper meanings. This gap aligns with the survey findings in Figure 4.13, where most users reported AidMax as partially capable of understanding cultural or linguistic nuances.

Stoiber observed that AidMax occasionally failed to align with the colloquial language of its users, leading to "bumpy" interactions. He suggested that adaptation to the user's linguistic styles could enhance its effectiveness and user trust. Janßen on the other hand emphasized the lack of deeper exploration in user interactions. He noted that while empathy was present in generic statements, AidMax often bypassed a fuller understanding of distress before proposing solutions. This tendency could alienate users who need validation more than immediate guidance. Quantitative data from Figure 4.7 shows that while most users found AidMax helpful, 40 percent were unsure, reflecting a lack of efficacy in addressing deeper emotional needs. Menzel highlighted that short or overly cheerful responses might signify underlying distress, yet AidMax often overlooked these subtleties. He recommended integrating an empathetic tone and personalizing interactions to resonate more with young users. Dr. Daiminger and Krämer pointed to the inability of AidMax to interpret non-verbal signals, such as tone or facial expressions. Daiminger suggested incorporating analyses of vocal characteristics, which could indicate depressive moods, although she acknowledged the complexity of this task. Krämer stressed that this gap is significant for adolescents, whose communication often relies on such subtleties. The survey results in Figure 4.9 corroborate this, showing that while 43 percent of participants felt AidMax understood their concerns, a significant portion indicated only partial understanding. This leaves room for improvement and aligns with criticisms from Professor Daiminger regarding the chatbot's formal tone, which might feel less relatable to younger audiences. The tone was adapted in the prompt but since ChatGPT is barely trained in informal German teen language it did not work so well.

The recurring theme across these expert perspectives is AidMax's struggle to interpret nuanced language, as well as its need for enhanced emotional understanding. Aicher, Unger and Krämer all highlighted gaps in detecting sarcasm and subtle despair. Their shared insights underscore the importance of refining sensitivity mechanisms. Similarly Janßen and Stoiber's emphasis on trust-building reflects a shared vision of improving reliability.

The limitations of current AI models in interpreting the language of depressed individuals stem from an inability to detect nuanced communication and insufficient sensitivity to non-verbal cues. These challenges as highlighted by the experts, point to the need for enhanced emotional intelligence and personalized interactions to better serve at-risk individuals.

5.3 Suicidal Ideation

The analysis of AI chatbot intervention through AidMax's role in reducing suicidal ideation among young social media users reveals differing expert perspectives in this part.

Aicher highlighted AidMax's potential in reshaping negative thought patterns and fostering self-esteem to prevent crises. She emphasized early intervention and strengthening social connections as preventive strategies. Similarly Unger viewed him as a tool to address academic pressures and advocated for networks like U25 and collaborations with influencers to enhance outreach. Stoiber underscored preventive questioning paired with relaxation exercises. Krämer saw the application's value in offering hope and actionable steps during early signs of loneliness. Survey findings supported those strengths, with users reporting moderate symptom improvement after using AidMax. However only a small proportion rated these improvements as strong, indicating limitations in fully alleviating distress for all users in Figure 4.8. Privacy concerns were noted by Janßen, who recommended steering users toward AidMax's website for secure interactions. Nevertheless the survey showed in Figure 4.11 that most participants have not had concerns about privacy protection.

AidMax's ability to connect users directly to crisis services with minimal effort was a key element in the crisis referral category. It reflected the reliance on external professionals for handling severe cases. Aicher and Unger noticed that AidMax connected users to professional services successfully. Daiminger suggested improving AidMax's capability by incorporating location-based clinic referrals using user-provided postcodes, which was not possible because of privacy. Similarly Janßen proposed testing the chatbot's referral processes through crisis simulations to ensure quick and professional support. Krämer and Menzel agreed that AidMax's role in bridging users to resources is crucial but noted that the ultimate action depends on the users. The survey findings reflected this concern, with many participants reporting that AidMax had not explicitly encouraged them to seek professional help in Figure 4.14. But the data comparison also shows that their concerns were not life-threatening since they did not discuss suicidal thoughts with AidMax. While the chatbot offers valuable support, the coordinator stressed that it cannot replace the human connection required for individuals with severe suicidal behaviors, which was also not intended by this study.

Experts recognized the limitations of AidMax in severe crises. Aicher acknowledged the application's reliance on external professionals for critical cases and Unger noted that while the chatbot provides emotional validation, it cannot replace human interaction in therapeutic settings. Janßen raised skepticism about AidMax's effectiveness without direct human contact, suggesting enhancements in communication speed and crisis response capabilities. Similarly Daiminger and Stoiber advocated strengthening cognitive-behavioral interventions to complement the chatbot's existing emotional validation features. Nevertheless the survey showed that many opened up to AidMax and even discussed Suicidal Thoughts in Figure 4.6 and were then guided to professional services.

The experts identified AidMax as a promising tool for early-stage support, preventive strategies and facilitating professional referrals. However limitations in ensuring user action highlight the need for further refinements. Shared perspectives underline the chatbot's preventive potential while differing opinions reflect diverse pathways to enhance its effectiveness and outreach.

6 Conclusion

In this chapter, the thesis findings are consolidated to highlight the opportunities and constraints in integrating an AI chatbot, named AidMax, into Instagram for supporting adolescents dealing with depression and suicidal ideation. The conclusions are drawn from the qualitative expert interviews and the quantitative survey data. The following sections elaborate on the main discoveries, contributions to the field, existing shortcomings and potential directions for future research.

6.1 Key Findings

AidMax demonstrated engagement among users from 15 to 25 years of age, which were selected because in this age group, the main cause of death is suicide. They were comfortable discussing a wide range of emotional concerns. Topics included depression, anxiety and suicidal thoughts. This highlights AidMax's role as an accessible support tool on a familiar platform. Since many adolescents already spend a good part of their daily life on social media, offering mental health support there reached a wide cross-section of individuals. AidMax fitted user needs with quick reply times, casual text interactions and an option for voice messaging. Even first-time users found this chatbot a comfortable starting point.

The integration of AidMax on Instagram offered insights into how digital platforms can facilitate mental health interventions. This familiar environment enhanced accessibility. Voice messaging and visual content enabled AidMax to engage with its audience. Data privacy concerns were moderate and measures were taken to ensure compliance with guidelines which to foster trust among users.

In practice, its capacity to identify explicit signs of suicidal ideation stood out. Rather than mishandling such acute situations, the chatbot guided at-risk individuals with clear instructions and a phone number to a crisis service. The expert interviews and user surveys showed that this step was valued as a convenient way to connect with help.

Another key finding involved observing a positive shift in user mood after chats with AidMax. Individuals reported feeling understood which pointed to a genuine sense of empathy. Teenagers struggling with daily academic stresses or social pressures felt helped by the combination of accessible conversation and immediate feedback from AidMax. Experts in crisis intervention underscored how even short chatbot interactions may lessen the feeling of isolation often associated with depression.

Risk reduction of suicidal ideation was also examined by the study. The survey responses indicated that users experienced mood improvements after their interaction with the chatbot. Also its design to provide anonymity addressed social stigma. AidMax provided relevant

suggestions for coping techniques, including self-care tips, daily routines or therapeutic approaches like CBT and DBT. And even if not all emotional subtleties were captured, the system successfully initiates essential conversations around mental health.

In conclusion, the integration into Instagram proved to be a promising approach for addressing teen mental health challenges. Limitations in interpreting nuanced communication did not lower the chatbot's ability to provide immediate and supportive interventions. It showed potential for broader applications in digital mental health care. The research contributes insights into AI technologies for mental health support and highlights areas for improvement.

6.2 Contributions

This thesis makes several contributions to digital mental health interventions by addressing research gaps. By integrating an AI chatbot, AidMax, into Instagram, the study explored the potential of widely used social media platforms to provide support for teen mental health. Unlike prior research that focused primarily on standalone applications, this work investigated the dynamics of integrating a chatbot within an environment where teenagers already engage daily. This novel approach expanded the understanding of how mental health interventions can be embedded into a familiar system. Thereby enhancing usability by leveraging platforms that users are already comfortable with.

One important contribution is showcasing how short, semi-structured dialogs with a chatbot can boost behavior among adolescents. The qualitative portion of the study, through interviews with psychological experts, supported AidMax's model of helping users. This "low-threshold support" is a fresh angle on promoting mental health.

A contribution lies in the methodological integration of qualitative and quantitative research to assess expert perspectives and user interactions. The qualitative interviews with mental health professionals offered insights into the strengths and challenges of using AI chatbots in therapeutic contexts. The quantitative survey data provided evidence of user engagement. This dual approach enriched the findings and allowed for a multidimensional analysis of AidMax's effectiveness and limitations.

Another contribution is that AI chatbots do not pose harm to teens because of safety filters, ongoing model evaluation and human oversight. Instead they can act as a secure and nurturing channel. The mixed-method analysis revealed that a chatbot can safely handle distress signals and encourage individuals to seek further professional assistance.

Additionally the research made an ethical contribution by emphasizing the importance of data privacy and user anonymity in digital mental health interventions. Stringent privacy measures and the ability for users to stay anonymous addressed concerns in the field. This ensures user trust and ethical compliance in future AI applications.

The work contributed to the theoretical discourse on mental health interventions by integrating psychological principles such as CBT, BA and DBT into the chatbot's responses. The feasibility of embedding therapeutic techniques within AI systems was demonstrated, which bridged the gap between psychological theory and practical implementation.

Overall this thesis offers a significant step forward to understand and develop AI-driven solutions for mental health. It provides practical insights into the integration of AI in familiar

digital environments and lays a foundation for future research in digital mental health applications.

6.3 Limitations

While this study achieved insights into the integration of AidMax as a mental health intervention, limitations must be acknowledged. First the chatbot's performance was constrained by the limitations of current NLP models. AidMax demonstrated difficulty in interpreting sarcasm and cultural subtleties, which are present in teenage communication. Linguistic diversity among users presented additional challenges, as the chatbot's ability to adapt to these differences remained limited. These limitations affected its ability to provide empathetic responses in indirect expressions of distress.

The study also faced challenges related to the reliance on Instagram as a platform. While Instagram's accessibility to teenagers was advantageous, its informal and fast-paced environment was difficult to handle. Sustaining meaningful engagement over time in such a setting proved challenging. Because users might be distracted by the platform's other content or exhibit short attention spans. Additionally the integration into a platform not designed for mental health interventions limited the level of control over AidMax responses.

The research design itself posed limitations, particularly in the scope of its evaluation. The sample size may not fully represent the broader teenage population. Furthermore the study focused on preliminary outcomes, leaving the long-term effects and sustainability of the intervention unexplored. The study also relied on user self-reporting to evaluate the chatbot's impact on mental health outcomes. While this approach provided valuable insights, it may have introduced biases, such as underreporting or overreporting improvements due to subjective perceptions.

Overall AidMax cannot substitute for a human psychiatrist in critical cases. While it can identify risk factors, share coping techniques and direct users to emergency services, deeper intervention often demands a structured care plan facilitated by licensed professionals. This study's design allows for a better first contact or a bridge between crisis and therapy, yet it does not negate the importance of traditional mental health interventions. The limitations underscore the need for continued technological refinement and further research to address the complexities of integrating AI into social media.

6.4 Future Work

This study has laid the groundwork for understanding how AI chatbots like AidMax can be integrated into social media platforms to support teen mental health. However several avenues for future work emerge from the identified limitations.

Based on the findings there are multiple ways to strengthen AidMax and extend it to other platforms. Future projects could concentrate on refining the AI to better decode slang and indirect communication styles common among teens. Training the model on bigger, more diverse datasets could improve its ability to detect subtle distress or coded expressions of self-harm.

Another area for exploration is optimizing the chatbot's engagement strategies within Instagram. Future research should focus on developing techniques to sustain user interest over longer periods. This could involve integrating gamification elements or creating more interactive features like the option to call AidMax. Understanding how to maintain meaningful engagement in these settings will be critical for maximizing the impact.

Data privacy and ethical considerations should also be a point for future work. While this study implemented measures to ensure user anonymity and secure data storage, evolving privacy concerns and regulations will require ongoing assessment and adaptation. Research into advanced encryption methods and transparent data usage practices will be essential to maintaining trust and compliance with global standards.

Expanding the scope of research to evaluate the long-term effects of chatbot interventions is another step. Longitudinal studies could provide deeper insights into how AidMax influences mental health outcomes over extended periods, including its role in preventing relapses or fostering sustained well-being.

Finally future research can look more closely at how to integrate AidMax into multi-channel contexts. This might include harnessing the synergy between Instagram, TikTok or Discord groups and thereby providing an omnipresent presence in a teenager's digital life. Beyond that forging alliances with professional organizations, such as mental health hotlines or youth help centers, can tighten referral loops and potentially save more lives at the acute crisis stage. This study has demonstrated the potential of AI chatbots in addressing teen mental health. Future work must focus on refining technological, ethical and operational aspects. By addressing these challenges AI-driven mental health interventions can prevent teen suicides even more effectively.

6.5 Closing Reflections

Overall the evidence in this thesis strongly suggests that an AI chatbot like AidMax can indeed help teens with depressive feelings and suicidal thoughts, while operating safe and controlled. Rather than harming young users, the structure of AidMax's design, using supportive prompts, clear crisis pathways and approachable language, fosters trust and encourages teens to speak up about issues they might otherwise hide. Its effectiveness springs from meeting adolescents in an environment they know well, addressing them in an empathetic tone and providing direct references to professional resources when necessary.

While there remains room for development, the study underscores how AI chatbots can serve as a proactive tool in digital mental health. By bridging serious user issues with a broad support network, this technology stands poised to make mental health assistance more timely and accessible. This can create a future where teens feel safe asking for help without hesitation and don't harm themselves.

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A Appendix

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 13.10.2024

Unterschrift des Forschenden: _____

1. Welche Daten werden erhoben?
Im Rahmen des Interviews werden folgende personenbezogene Daten erhoben:

- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
- Allgemeine Berufsbezeichnung
- Antworten und Meinungen, die während des Interviews geäußert werden
- Datum und Uhrzeit des Interviews

Das Interview wird aufgezeichnet, um die Inhalte später für die Analyse auswerten zu können.

2. Wie werden die Daten verarbeitet?

- Die Daten werden ausschließlich für wissenschaftliche Zwecke im Rahmen der Masterarbeit verarbeitet.
- Die Audioaufnahmen werden transkribiert und übersetzt.
- Die Daten werden sicher auf passwortgeschützten Geräten gespeichert und gemäß den Datenschutzbestimmungen nach Abschluss des Forschungsprojekts gelöscht.

3. Wofür werden die Daten verwendet?
Die erhobenen Daten dienen dazu, die Effektivität und mögliche Verbesserungspotenziale des AidMax-Chatbots zu untersuchen. Die Ergebnisse werden in der Masterarbeit veröffentlicht und könnten in Präsentationen oder wissenschaftlichen Publikationen verwendet werden.

4. Freiwilligkeit und Widerrufsrecht:
Ihre Teilnahme an diesem Interview ist vollkommen freiwillig. Sie können Ihre Einwilligung jederzeit, ohne Angabe von Gründen, widerrufen. In diesem Fall werden Ihre Daten vollständig gelöscht.

Einwilligungserklärung:
Hiermit bestätige ich, dass ich die obenstehenden Informationen gelesen und verstanden habe. Ich bin mit der Teilnahme am Experteninterview einverstanden und willige in die Verarbeitung meiner Daten, wie beschrieben, ein. Mir ist bekannt, dass ich meine Einwilligung jederzeit widerrufen kann.

Name: Sabine Müller

Ort, Datum: 13.10.2024

Unterschrift: S. Müller

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 14.10.2024

Unterschrift des Forschenden: 

1. Welche Daten werden erhoben?
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- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
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4. Freiwilligkeit und Widerrufsrecht:
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Einwilligungserklärung:
Hiermit bestätige ich, dass ich die obenstehenden Informationen gelesen und verstanden habe. Ich bin mit der Teilnahme am Experteninterview einverstanden und willige in die Verarbeitung meiner Daten, wie beschrieben, ein. Mir ist bekannt, dass ich meine Einwilligung jederzeit widerrufen kann.

Name: Katharina Unger

Ort, Datum: Eching, 25.11.24

Unterschrift: 

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 30.10.2024

Unterschrift des Forschenden: _____

1. Welche Daten werden erhoben?
Im Rahmen des Interviews werden folgende personenbezogene Daten erhoben:

- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
- Allgemeine Berufsbezeichnung
- Antworten und Meinungen, die während des Interviews geäußert werden
- Datum und Uhrzeit des Interviews

Das Interview wird aufgezeichnet, um die Inhalte später für die Analyse auswerten zu können.

2. Wie werden die Daten verarbeitet?

- Die Daten werden ausschließlich für wissenschaftliche Zwecke im Rahmen der Masterarbeit verarbeitet.
- Die Audioaufnahmen werden transkribiert und übersetzt.
- Die Daten werden sicher auf passwortgeschützten Geräten gespeichert und gemäß den Datenschutzbestimmungen nach Abschluss des Forschungsprojekts gelöscht.

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Name: _____

Ort, Datum: München, 02.12.2024

Unterschrift: _____

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 08.11.2024

Unterschrift des Forschenden: _____

1. Welche Daten werden erhoben?
Im Rahmen des Interviews werden folgende personenbezogene Daten erhoben:

- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
- Allgemeine Berufsbezeichnung
- Antworten und Meinungen, die während des Interviews geäußert werden
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Name: JANSEN, Christian

Ort, Datum: München, 7/12/24

Unterschrift: _____

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 08.11.2024

Unterschrift des Forschenden: _____

1. Welche Daten werden erhoben?
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- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
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Name: Marvel Stöcker

Ort, Datum: München, 6.12

Unterschrift: _____

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung:

Unterschrift des Forschenden: _____

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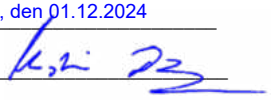
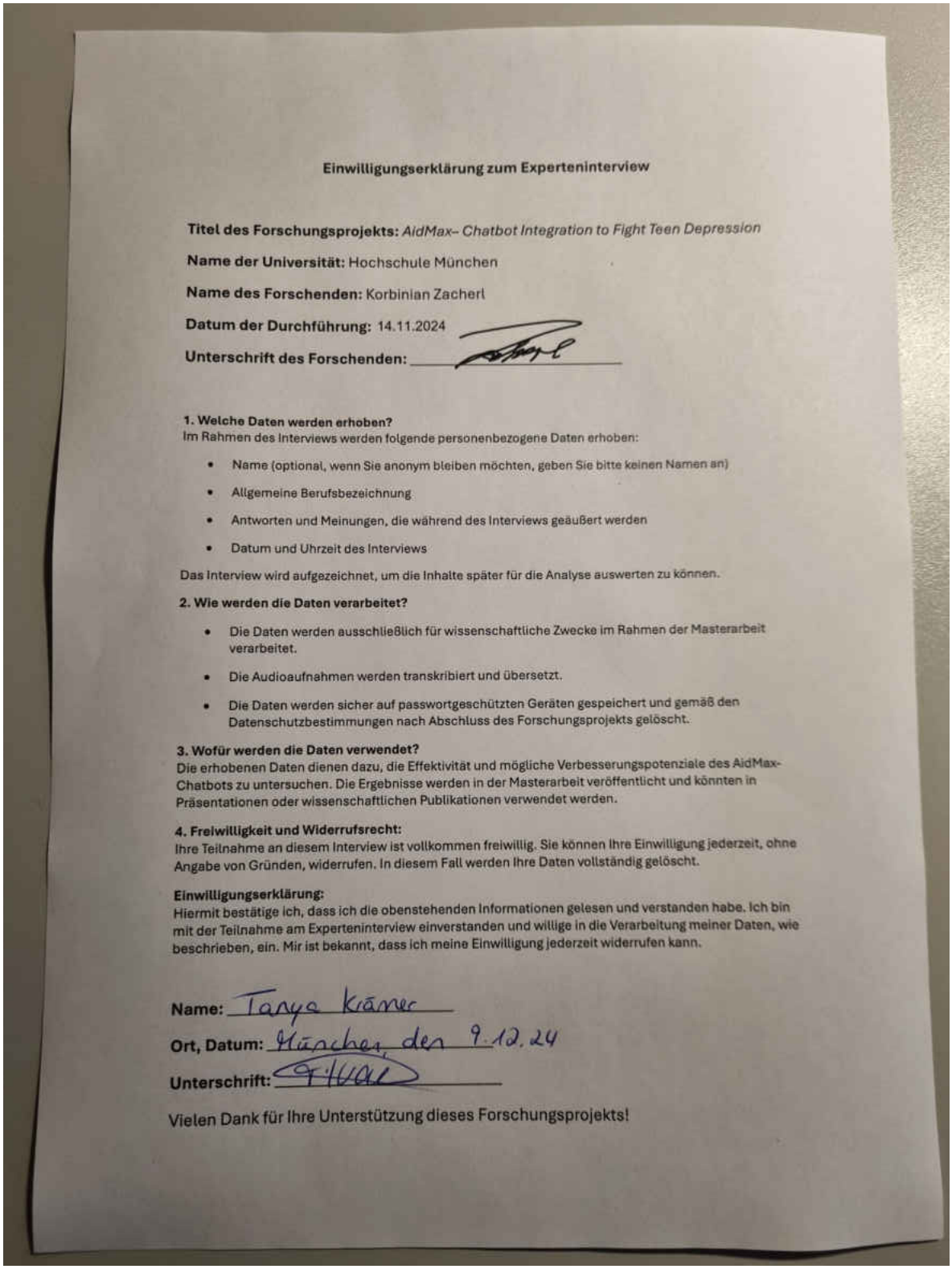
Name: Prof. Dr. Christine Daminger

Ort, Datum: München, den 01.12.2024

Unterschrift: 

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!



Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 14.11.2024

Unterschrift des Forschenden: _____

1. Welche Daten werden erhoben?
Im Rahmen des Interviews werden folgende personenbezogene Daten erhoben:

- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
- Allgemeine Berufsbezeichnung
- Antworten und Meinungen, die während des Interviews geäußert werden
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Name: Tanya Krämer

Ort, Datum: München, den 9.12.24

Unterschrift: _____

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Einwilligungserklärung zum Experteninterview

Titel des Forschungsprojekts: *AidMax– Chatbot Integration to Fight Teen Depression*

Name der Universität: Hochschule München

Name des Forschenden: Korbinian Zacherl

Datum der Durchführung: 14.11.2024

Unterschrift des Forschenden: 

1. Welche Daten werden erhoben?
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- Name (optional, wenn Sie anonym bleiben möchten, geben Sie bitte keinen Namen an)
- Allgemeine Berufsbezeichnung
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Name: Mark Menzel

Ort, Datum: München, 14.11.2024

Unterschrift: 

Vielen Dank für Ihre Unterstützung dieses Forschungsprojekts!

Declaration of Academic Integrity / Eidesstattliche Erklärung

Ich erkläre, dass ich die vorliegende Arbeit selbständig, ohne fremde Hilfe und ohne Benutzung anderer als der angegebenen Quellen und Hilfsmittel verfasst habe und dass alle Ausführungen, die wörtlich oder sinngemäß übernommen wurden, als solche gekennzeichnet sind. Mit der aktuell geltenden Fassung der Satzung der Hochschule München zur Sicherung guter wissenschaftlicher Praxis und für den Umgang mit wissenschaftlichem Fehlverhalten bin ich vertraut. Ich erkläre mich einverstanden mit einer Überprüfung der Arbeit unter Zuhilfenahme von Dienstleistungen Dritter (z.B. Anti-Plagiatssoftware) zur Gewährleistung der einwandfreien Kennzeichnung übernommener Ausführungen ohne Verletzung geistigen Eigentums an einem von anderen geschaffenen urheberrechtlich geschützten Werk oder von anderen stammenden wesentlichen wissenschaftlichen Erkenntnissen, Hypothesen, Lehren oder Forschungsansätzen.

München, 1. Januar 2025

Korbinian Zacherl
Vorname Nachname

I hereby confirm that I have composed this scientific work independently without anybody else's assistance and utilising no sources or resources other than those specified. I certify that any content adopted literally or in substance has been properly identified. I have familiarised myself with the most recent Guidelines for Good Scientific Practice and Scientific Misconduct Ramifications of the University of Applied Sciences Munich. I declare my consent to the use of third-party services (e.g., anti-plagiarism software) for the examination of my work to verify the absence of impermissible representation of adopted content without adequate designation violating the intellectual property rights of others by claiming ownership of somebody else's work, scientific findings, hypotheses, teachings or research approaches.

München, 1. Januar 2025

Korbinian Zacherl
Firstname Lastname