

Student therapists' experience of learning using a machine client: a proof-of-concept exploration of ERIC (Emotionally Responsive Interactive Client).

Abstract

Background:

The use of artificial intelligence (AI) is increasing in many areas of health care, including mental health care. The automated nature of such technologies has the potential to be developed to work with large numbers of people. This paper examines the way that student therapists experience using an interactive **text-based** machine client as a training tool.

Methodology:

Chatbot technology has been used to develop ERIC (Emotionally Responsive Interactive Client). This introduces individuals to concepts of person-centred therapy (**Empathy, congruence and unconditional positive regard**) by using a series of pre-programmed scenarios. 28 student therapists evaluated ERIC's potential as a learning tool. Individuals were recruited from one university from a postgraduate and an undergraduate counselling programme.

Findings:

Feedback was generally positive, with all reporting that they enjoyed engaging with ERIC as a learning method. ERIC helped individuals consider their understanding of counselling skills in a non-judgmental environment. Participants felt the scenarios were realistic and engaging, with many reporting that they felt they were engaging with a real client/person due to ERICs' ability to express emotions.

Discussion:

ERIC is at the proof of concept phase. From the feedback presented here it is evident that it can be a useful learning tool. Further development of ERIC, with feedback from a larger sample is however required. **ERIC is currently a text-based client and further development would like to see the intervention be voice activated to enhance the experience.** ERIC can be further enhanced and adapted to be a useful learning platform for student therapists as well as for students in other (healthcare related) disciplines whereby a client or patient is required.

*Key words: Artificial Intelligence, Machine learning, counselling, therapy, chatbots, student therapist, **training tool**.*

Implications for Practice and Policy

- The feedback from students reflected that automated tools can provide an engaging way of learning about therapeutic theory.
- The feedback from students also reflected that they believed that automated training resources have the potential to provide non-judgmental support for their learning.
- Professional bodies, that accredit therapy training courses, will have to consider the appropriateness of new pedagogical approaches that are developed to introduce students to counselling skills

Introduction

Chatbots as learning tools

Chatbots form a branch of artificial intelligence (AI) that uses natural language processing (NLP) to emulate human interaction using a systemised agent. The intuitive yet systemised communication between human and computer has been applied to a diverse array of roles that have been traditionally performed by a human agent, for example, healthcare support, product recommendation, or technical troubleshooting (Adamopoulou & Moussiades, 2020). These roles can vary significantly in purpose, field of application, and complexity, from the skills performed by virtual home assistants such as Amazon Alexa and Google Assistant, which in 2021 were accessed by 38% of adults in the UK and 48% of US internet users (Kinsella, 2021; Marketing Charts, 2021), to standardised diagnostic tools in healthcare that free up physician time for more demanding patient matters (Jovanovic, Baez, & Casati, 2020; Adamopoulou & Moussiades, 2020). At the time of this study, the proliferation of chatbots is ongoing as familiarity with the technology matures, and its use becomes established as an ordinary part of daily life (Følstad, et al., 2021; Insider Intelligence, 2022). This commonplace acceptance has given rise to affordable development and hosting platforms that facilitate the rapid development of chatbot implementations (Thorat & Jadhav, 2020). Whilst this has made development and implementation more accessible to organisations irrespective of budget and technical expertise, it has also seen chatbot solutions developed without due attention to their design, or in many cases without follow up study into their efficacy (Hwang & Chang, 2021). **It is important that user and other stakeholders are involved in the co-production of such technology in order to make sure it is doing what it claims to be doing for the user** (Wollny, et al., 2021; Bahja, Hammad, & Butt, 2020).

A review of educational chatbots found they are typically used in one of three pedagogical roles; assisting, mentoring, and teaching. Here they have been used to either streamline processes, support student life, or act as an educator (Wollny, et al., 2021). The variation in implementations has seen them assume responsibility for delivering a wide range of material, from generalised content such as campus and timetable information, to the targeted teaching of specific academic subjects (Smutny & Schreiberova, 2020). The range of academic subjects that have been delivered to students by chatbots to date, along with the additional services they have provided, demonstrates how adaptable and beneficial they can be in an educational setting (Wollny, et al., 2021; Smutny & Schreiberova, 2020; Quiroga Perez, Daradoumis, & Puig, 2020).

Whilst the use of chatbots in education is both widespread and diverse (Quiroga Perez, Daradoumis, & Puig, 2020), it has not been without criticism. **Issues raised**, include usability concerns over the suitability of the information presented and its style of delivery to users. Here, existing **technology has** been criticised for exhibiting a machine-like discourse that lacks personality (Smutny & Schreiberova, 2020), and delivering material that is governed by those involved in the development process instead of through the analysis of actual student needs (Wollny, et al., 2021; Bahja, Hammad, & Butt, 2020). This is perhaps a result of the lack of reported empirical evidence that is available on the use of chatbots in education, specifically in what makes them successful, and what they have done to advance learning among students (Hwang & Chang, 2021; Wollny, et al., 2021). By engaging suitable stakeholders and field specialists, research projects that carefully consider the design in terms of how the

information is presented, the style of its delivery, and the content included, can respond to some of these shortfalls (Chaves Steinmacher & Gerosa, 2020). Furthermore, reinforcing this with the measured study of user experience to gauge the effectiveness of the chatbot to its intended design will provide valuable insight into successful solution design as well as contribute to a growing knowledge base in this applied area of chatbot implementation (Patel, 2021; Hwang & Chang, 2021). This study proposes a new educational chatbot for student therapists, the design of which is cognisant of some of the reported criticisms in the literature reviewed.

Training Therapist

There are numerous routes for training to be a therapist. These can vary in length and focus and are often guided by the requirements of professional bodies who oversee such work. Within the United Kingdom, the British Association for Counselling and Psychotherapy (BACP) is the largest professional body and provides a syllabus that many training providers follow. The Counselling Skills Competency Framework (BACP, 2020) provides therapists a framework for skills in the development of empathy, therapeutic skills and techniques, the development of working alliances and personal qualities. The syllabi that is advocated by professional bodies typically requires students to engage in a combination of theoretical learning, personal development, and practical engagement. The latter generally involves engaging in role play exercises with peers and the engagement in supervised real-world therapy. **Such work can be challenging for students, due to ensuring ecological validity and the authenticity of assessments and the difficulties students may find with transferring skills to real world practice.**

One of the most common counselling training exercises is to engage in triad work. Such exercises involve students taking on one of three roles, a therapist, a client, and an observer (McLeod, 2018; Smith, 2016). Students are then asked to practise their therapeutic skills with one another and receive feedback from the observer. Such work provides important experiential learning about being in the role of a therapist. Whilst the learning from these activities is viewed as essential within many counselling courses, they are time intensive and rely upon individuals being present in the same space. Consequently, students may only be able to practise their skills during the allotted class time. Such practical difficulties might be observed in other professional disciplines in which technological solutions have been developed. For instance, within dentistry, students are provided with a robot patient to practise with and complete assessments before working with patients in the real world (Grischke, Johannsmeier, Eich, Griga & Haddadin, 2020). From a review of the literature, the authors, Grischke et al (2020) felt that dentistry could benefit from an increase in the use of dentronics (technological developments in dentistry) in order to advance dentistry, with findings from mostly pilot studies viewed positively. Whilst moving from physical to psychological health care might be viewed as a significant leap, the advent of new technologies starts opening doors to such a possibility. Fiske, Henningsen and Buyx (2019) consider the ethical and social implications of AI applications in mental health care, recognising that AI is promising with benefits including **engagement of populations not traditionally supported by services** and the freeing up of professional's time. Several ethical issues and concerns raised include issues around risks, harm prevention, data management, and the potential for misuse. **In terms of medical training a recent systematic**

review recognised the importance for medical students being knowledgeable of the use of AI technology, suggesting that AI training is an integrated part of the medical curriculum (Sapci & Sapci, 2020). Linking in with the NHS long term plan, the NHS aims to make better use of data and digital technology to support the delivery of community based physical and mental care (NHS, 2019). Chapter five of the strategy outlines how digital technology will support, with “ready access to decision support and AI”. The chapter also mentions the predictive techniques employed to support care. AI can support tasks that don’t require a human, supporting clinicians with diagnostic accuracy, they can handle large amounts of data and guide decision making (Lee, Torous, De Choudhury, Depp, Graham, Kim, Paulus, Krystal & Jeste, 2021).

The present study: Rationale and Research Questions

The present study proposes a new use for chatbots in the form of a machine client to help student therapists learn and practise their counselling skills in a simulation of a counselling triad. As noted above, counselling triads are commonly used by therapists to practise their skills, and in this proof of concept study, the triad is **utilised**. The student therapist is the end user, the chatbot is the client, and a secondary chatbot persona acts as the observing tutor to facilitate the process and offer feedback on performance. In reference to the prior evaluation of chatbots in the field of education and some of the analyses discussed (Wollny, et al., 2021; Smutny & Schreiberova, 2020; Quiroga Perez, Daradoumis, & Puig, 2020; Hwang & Chang, 2021; Bahja, Hammad, & Butt, 2020; Ali Amer Jid Almahri, Bell, & Arzoky, 2019), recently qualified therapists and subject matter lecturers were consulted on an informal basis to gauge a knowledge base for the chatbot and how the material should be delivered. **ERIC was co-produced with user and stakeholder input in terms of what counselling skills the tool would focus on, the conversational discourse and feedback provided.** For realism, more general areas of study on chatbots were consulted with the intent of creating a perceptively realistic portrayal of a client with the ability to respond with emotion and illicit emotion from the end user (Ali Amer Jid Almahri, Bell, & Arzoky, 2019; Feine, Gnewuch, Morana, & Maedche, 2019). This study pilots ERIC, a proof of concept “Emotionally Responsive Interactive Client” designed to help student therapists practise and refine their counselling skills without the need to enlist an actual client. A recent book chapter by the authors provides details of the design of ERIC as well as the theory and rationale behind ERIC (Ogilvie, Prescott, Hanley, & Carson, 2022).

The following research questions were considered in this study:

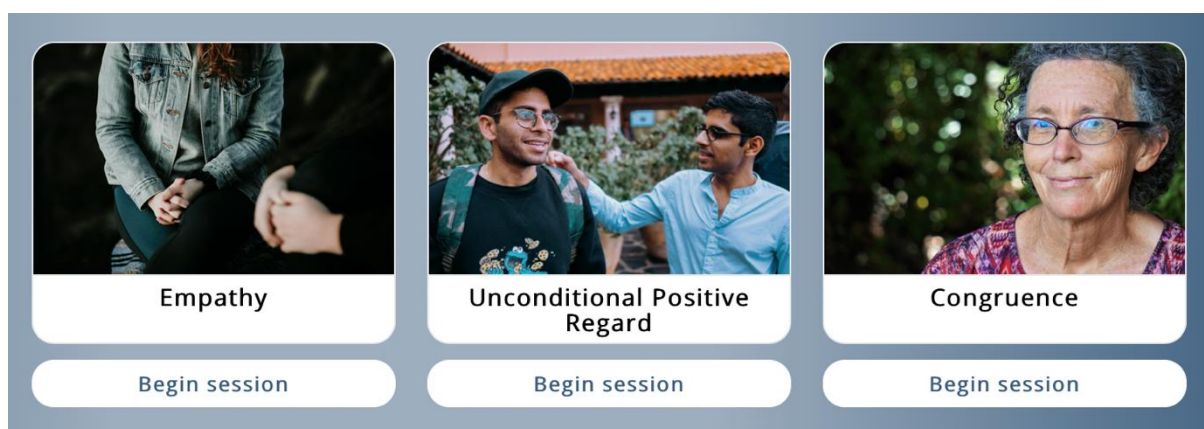
- RQ1. What are students' general attitudes towards ERIC as a learning tool?
- RQ2. Do students find ERIC to be an engaging learning tool?
- RQ3. How does a chatbot learning tool for students aid develop of counselling skills?
- RQ4. In what way does ERIC encourage students to reflect on their counselling skills?

Method

Study Design

ERIC was introduced to students enrolled on the MSc Counselling and Positive Psychology course, and the BSc Psychology, Psychotherapy and Counselling course, at the University of Bolton. ERIC assumes a chatbot persona of counselling client, which allows students to engage as a therapist without requiring a human agent as a client. A tutor persona was also incorporated into the design to facilitate the overall process and act as the observing participant in a counselling triad, necessary to provide feedback to the student on their performance. ERIC has been systematically instructed to react based on how the student operates as a therapist; having been specifically programmed to provide educational support for learning about the three core conditions of person-centred therapy: empathy, unconditional positive regard, and congruence (McLeod, 2018) (see Figure 1 for an element of the ERIC package).

Figure 1: Chatbot session selection



The students' introduction to ERIC was timed to coincide with the delivery of appropriate curriculum content, specifically that covering the Rogerian approach to counselling. Once the students had completed the pertinent lecture, they were given the link to access ERIC as well as the link to the evaluation form. They were also able to access the evaluation directly from ERIC after completing at least one counselling session. ERIC does not capture any identifying data; therefore, students can practice their skills anonymously. However, as expected from a chatbot platform, the conversation that drives the AI capability was recorded.

Evaluation

The evaluation form was created using Google forms and made available to participants for 1 month. The form comprised basic demographic information, structured questions, along with free text answers to gather qualitative information on the students experience of interacting with ERIC. The evaluation element focused broadly upon the students' (i) *attitudes towards*, (ii) *engagement with* and (iii) *perceived utility of* the chatbot resource. **Participants were asked if they thought ERIC was engaging, a useful learning tool, the skills they felt they had used, what they liked and how they might like to see ERIC improved.**

The evaluation form was anonymous, unless the participant agreed to take part in a follow up study, in which case an email address was captured. Where this occurred, it was removed from the data prior to importing it into SPSS.

Participants

31 students completed at least one counselling training session with ERIC during the time the evaluation was open. Of these, 28 went on to complete the evaluation form. Of the 28 participants, 11 were postgraduate students (response rate $11/22 = 50\%$). and 17 were level 5 undergraduate students ($17/25 = 68\%$). The participant group was predominantly female ($n=23$) and well represented across all the age categories (7 aged 18-25, 7 aged 26-35, 5 aged 36-45, 6 aged 46-55 and 3 aged 56+). This is representative of the student population on the courses. 12 participants took part in the empathy session, 5 the unconditional positive regard, 4 the Congruence and 10 did all three sessions. There were 11,536 outgoing messages, and 3691 incoming message. This means that on average each user would have interacted 34.5 times (button/link clicks) with ERIC. There were 23 different pathways (communication journeys) that they users travelled through their chatbot conversations however it did not capture any information on how long these lasted for. The functions within were well used as is shown by the average number of interactions per user, and that all the different areas were well explored through the number of pathways.

Data analysis

A concurrent mixed methods design was employed to gain user feedback (Hanson, Creswell, Clark, Petska, & Creswell, (2005). As such the questionnaire collected both quantitative information and qualitative information to help answer the research questions noted earlier. Descriptive statistics were used to summarise the structured answers in the evaluation. Thematic analysis was used to analyse the qualitative data obtained from the evaluation in accord with the process proposed by Braun and Clarke (2006). Due to the relatively brief nature of the quotes provided by Participant s, the analysis conducted made use of semantic coding, rather than latent, around the research questions that have been posed. As such, whilst the themes generated are reflective of the data obtained, it is acknowledged that the analysis is limited. The first author undertook the qualitative analysis (JP) with LO and TH reviewing the data and the conclusions generated (Elliott, Fischer, & Rennie, 1999).

Ethics

Ethical approval was obtained from the Department of Psychology ethics committee at the University of Bolton.

Analysis

In the section below we reflect and briefly outline the descriptive and thematic analysis conducted on the data which has been organised into two areas; engagement and learning resource. The following table (table 1) presents the themes, definitions and examples of associated quotes.

Table 1- themes, definitions, quotes

Theme	Sub theme	Definitions	Quotes
Engagement			
	Emotional responses	A level of emotion was found from the responses which increased the level of engagement felt by the students.	<i>Giving context and emotional responses (participant 4)</i> <i>Eric was able and willing to open up when questions are being asked. Eric was able to express his feeling. (participant 18)</i>
	Real situation/client	Students felt they were engaging with a real situation/client.	<i>He helps me to interact with him like a physical client hence being able to develop my counselling skills (Participant 5)</i> <i>It felt like i was having a conversation with a real person. His issues and problems made me think of responses to give. Participant 9)</i>
	Could reflect on responses	Students were able to reflect on the session and the responses they were. receiving from the client and the tutor which enhanced engagement and the learning experience.	<i>Yes. He helped me to reflect on me responses and how I can improve in using my counselling skills. (participant 18)</i> <i>Yes as going into depth and providing examples allows me to reflect on how concepts can</i>

			<i>be used in a variety of situations. (participant 25)</i>
	Tutor was helpful with informative feedback	Feedback enabled students to think of their counselling skills and the feedback received was vied helpful.	<i>The tutor feedback made it really obvious why some responses were not the best to pick, but did not give away the right answer (participant 15)</i>
Learning resource		A learning resource that enhanced their counselling skills through reflection and constructive feedback.	<i>Once you get into it and apply it you will understand how important it is and it opens your mind and enhances your understanding (participant 26)</i> <i>I can use it on my own whenever I need to. I think it's really good. (participant 2)</i>
	Reflection		<i>The feedback helped me to evaluate my responses and reflect on future progress. (participant 16)</i> <i>Shows what I am good at and what I needed to work more on. So self-awareness (participant 20)</i>

	Constructive feedback		<i>the chatbot is an opportunity to practice skills; identifies what skills you are using; also shows inappropriate responses which is a useful learning aid; links to Counselling Tutor embedded in module sessions; links to additional learning material; able to practice when not with peers participant 10)</i>
--	-----------------------	--	---

Engagement

In terms of engagement, 93% of the participants felt that ERIC was engaging, 7% were unsure. What they felt was engaging was that ERIC offered students the opportunity to practise and develop their counselling skills in an interactive and novel way. The students who responded to the questionnaire found this basic version of ERIC easy to follow and clear to understand. 97% of participants felt they had used their counselling skills during the session. When asked about the skills the students felt they had used through engaging with ERIC, they reported applying several counselling skills. These were reported as; reflection, immediacy, empathy and empathetic listening, congruence, unconditional positive regard, questioning, focusing, emphasising, being non-judgemental and active listening (albeit reading).

Overall, the participants found ERIC as an engaging way to practise their counselling skills. Interestingly, *from the open-ended responses it is clear that many participants believed ERIC was engaging because they felt they were holding a conversation with a real person, in a real situation due, in part, due to ERIC's ability to articulate emotion.* The tutor feedback also helped to keep students engaged as they found this a very useful way to learn. Four themes were identified in the data

- **Emotional responses-** *"Eric was able and willing to open up when questions are being asked. Eric was able to express his feeling" (participant 17)*
- **Real situation/client-** *"even though it was a robot client, it seemed like a real-life situation which made it seem as though I was communicating with a real person" (participant 6)*

- **Could reflect on responses-** *“The feedback that I got straight away helped me reflect back on my answers straight away whilst recognising what I could have done better”. (participant 12)*
- **Tutor was helpful with informative feedback-** *“The fact that I had the assistance of a virtual tutor was not left there on my own. Eric also made me think of a real-life experience and how I'd assist as an actual counsellor”. (participant 20)*

Learning resource

All the participants reported that ERIC was a useful learning tool, with 97% stating that ERIC had made them think about their counselling skills. ERIC was received positively as a learning tool because the problems he presented felt real as were his responses – *“He helps me to interact with him like a physical client hence being able to develop my counselling skills” (participant 5)*. They enjoyed the flexibility the bot offered in terms of accessibility and being able to access when they wanted to. The feedback and explanations provided by the tutor were also useful learning tools within the bot. It is evident that the tutor feedback was very much a useful part of ERIC. The tutor feedback enabled the students to understand where they used the skills and allowed the student to reflect on the responses, if either **appropriate or not**- *“The feedback that offered me the chance to understand my mistakes. The wrong and right answers, teaching you what you are good at and what you need to improve on” (participant 21)*.

The ability to reflect on both the responses and the feedback as well as the ability to practice their counselling skills was how students felt ERIC best supported their learning. ERIC was viewed as a useful revision/refreshers tool that students could use in their own time. The feedback was helpful if they got the answer correct or incorrect and they also found that the feedback allowed them to think about their responses – *“it facilitates growth for me to improve as a trainee counsellor by giving me feedback on where I used my skills well and where I could have improved for future -enabled students to become more self-aware”(participant 6)*.

Students also felt that ERIC provided a way of learning in a non-judgemental way whilst enabling them to apply their skills and learning what are good counselling skills. Students learned through the ability to be able to focus on a specific area or skill and they also gained self-awareness as they could see what they need to focus on and develop more – *“For students counsellors it's priceless to be able to practice and learn how to respond to different scenarios” (participant 8)*.

Suggested improvements

The suggested improvements for ERIC tended to centre around making it more comprehensive as it is currently quite basic as an initial proof of concept idea. So, improvements suggested were around more scenarios and questions, more advanced, longer conversation potential to but in own answers and basically more complexity to ERIC *“maybe let the conversation go for a bit longer to have more of a flow and give a chance to show more of the counselling skills and core conditions” (participant 6)*. There was also the suggestion

that ERIC could have different settings to allow students to practice skills at different levels, basic, intermediate, and advanced.

Discussion

This discussion provides a reflection on how both the descriptive data and the thematic analysis combine to answer the research questions that were posed at the outset of this project. **It must be recognised as a limitation that the evaluation included a small overall sample size and the sample size is small across the three modules** Each question is considered in turn below.

What are counselling students' general attitudes towards ERIC as a learning tool?

ERIC was generally well received by the 28 undergraduate and postgraduate counselling students. They liked the simplicity of the chatbot and the addition of the tutor within the chatbot. The tutor feature within the bot was a feature the students particularly liked and valued as a learning tool potentially due to a learning style (triad) to practice counselling skills they were familiar with. From a systematic review of robotics and artificial intelligence in healthcare during the recent pandemic, Srker, Jamal, Ahmed and Irtisam (2021)

Do counselling students find ERIC to be an engaging learning tool?

For RQ2 gaining an insight to how engaging students felt ERIC was and why. It was evident and surprising that students were so positive about this and that they felt they were in conversation with a person and the content and conversation felt real. This is a very promising outcome of the chatbot. **From the feedback, the fact ERIC is simple, and the simplistic design seemed to be an attractive feature for encouraging engagement.** Given this criticism, it proved surprising to the research team how much students engaged with ERIC and felt his response were emotive. This finding also contradicts previous research in the area that suggests machines are perceived to lack personality (Smutny & Schreiberova, 2020).

ERIC proved to be an unconventional learning tool for the students. Arguably, the novel aspect to the resource helps to explain why students reacted so positively to the use of ERIC. Technology enhanced learning within the higher education sector is growing and positively received by teachers and students (Kennedy & Dunn, 2018; Downie, Gao, Bedford, Bell, & Kuit, 2021). It could also be that those students open to innovative technologies in their learning utilised and evaluated ERIC. The students know the first author as their tutor and for many students, their programme lead, this may have impacted the feedback received.

How does a chatbot learning tool for counselling students aid develop of counselling skills?

In terms of developing their counselling skills, students found ERIC to be a useful revision tool and a means to practise and refine what they had learnt. Students felt they reflected upon a

range of counselling skills whilst engaging with the resource. What is also evident from the feedback is the tutor feedback allowed students to reflect on the skills they had used. This is an important learning tool for students and emulates the triad approach to learning these students utilise throughout their undergraduate and postgraduate counselling training.

In what way does ERIC encourage students to reflect on their counselling skills?

Students felt they learnt from ERIC via reflecting on the answers they got wrong and the tutor input into throughout. The triad approach ERIC provided is an established way student practice their counselling skills (McLeod, 2018; Smith, 2016). The addition of the tutor therefore provided these counselling students with a familiar way of learning/practising their counselling skills. This is important as the learning is the same just provided through technology rather than in person. When considering the impact of the recent pandemic on the transition of learning utilising technology, students are now well versed in adapting their learning to a technology-based learning approach (Downie, Gao, Bedford, Bell, & Kuit, 2021).

In terms of ethical issues, it would depend to some degree on the regulatory body. For instance, the new Health and Care Professions Council (HCPC, Practitioner psychologist standards of proficiency, 2023) standards state that changes to practice needs to take account of new developments, technologies and changing context. Implying that professionals need to be aware and adaptive to new technologies and technological developments that support counselling psychologists based on the more general ethical principles that underpin professional practice. Whereas, the British Association for Counsellors and Psychotherapy (BACP, 2022) competences for work with children and young people framework identifies a set of criteria for engagement of digital method, however nothing is specific to digital training tools. It is not the suggestion that ERIC replace humans altogether but is in addition. ERIC provides another way of engaging students in the learning process. Having a variety of pedagogies can arguably enrich the learning experience and, in this case, provide a means of complementing class-based activities with an automated programme.

Limitations and Further Research

One of the main limitations of the study is the small sample size. This is a proof of concept idea which has received great feedback, however more students need to utilise ERIC in the future to enable the authors to further improve ERIC and gain user input into *his* development. Linked to this limitation is the limitation around the sampling strategy. As mentioned, the students that utilised ERIC were all students of the first author. This may have impacted feedback and skewed the findings. To limit any bias, students were asked to complete ERIC by a researcher (second author), however students may have been influenced to respond in a positive way due the sampling strategy employed. Although ERIC did not obtain any identifiable data, students may have been biased in their response. It should also be acknowledged that all the students where at one university and so widening the recruitment strategy for further research into ERIC will be beneficial and essential.

Currently ERIC is a basic chatbot designed as a proof of concept. ERIC was created with the aim of developing a more sophisticated AI system that can be used as a teaching tool for several different student professionals such as nurses, social worker, and teachers. ERIC will be available on a free website and tailored depending on the health care training needs of the profession. We envision that ERIC will be sophisticated enough to show a range of emotions, be programmed for different conditions and emotional states, and enable students to practise a range of counselling skills and refine their knowledge on a wide range of areas. Ethical dilemmas are one area the research team feel ERIC could be useful in developing for counselling students. Moving forward it would be invaluable to get further student feedback on ERIC in the form of brief interviews with students to help design ERIC further. Through student engagement in the further development of ERIC, the team will be able to gain a greater insight into what students want, like and need (Wollny, et al., 2021; Bahja et al., 2020).

Conclusion and Implications

It is clear the students were able to reflect upon their skills and enjoyed the experience of enhancing their learning with ERIC. The feedback enabled students to reflect on their answers and develop their skills from this feedback and reflection. The proof of concept work reflected in this paper is promising. However further research and development of ERIC is needed in order to determine if it is a suitable learning resource for other disciplines that may utilise a similar approach to teaching, or where training can be practised on a client/patient. It is also envisioned that ERIC will be developed to offer students more in-depth conversations. This proof-of-concept study adds to the field and furthers our understanding of what makes chatbots successful learning tools and how they engage and encourage learning in students (Hwang & Chang, 2021; Wollny, et al., 2021).

Acknowledgments

The authors would like to thank the University of Bolton for funding this project through the Jenkinson fund J2209.

References

- Adamopoulou, E., & Moussiades, L. (2020). Chatbots: History, technology, and applications. *Machine Learning with Applications*, 2, DOI: 10.1016/j.mlwa.2020.100006.
- Ali Amer Jid Almahri, F., Bell, D., & Arzoky, M. (2019). Personas design for conversational systems in education. *Informatics*, 6(4), DOI: 10.3390/informatics6040046.
- British Association for Counselling and Psychotherapy. (2022). Competences for work with children and young people framework
- Bahja, M., Hammad, R., & Butt, G. (2020). xA user-centric framework for educational chatbots design and development. *HCI International 2020 - Late Breaking Papers: Multimodality and Intelligence*, 32-43.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- BACP (2020). Counselling Skills Competency Framework. British Association for Counselling and Psychotherapist. Leicestershire <https://www.bacp.co.uk/media/8890/bacp-counselling-skills-competence-framework-may20.pdf> accessed 9th November 2022

- Chaves Steinmacher, A., & Gerosa, M. (2020). How should my chatbot interact? A survey on humanchatbot interaction design. *International Journal of Human-Computer Interaction*, 37(8), 729–758.
- Downie, S., Gao, X., Bedford, S., Bell, K., & Kuit, T. (2021). Technology enhanced learning environments in higher education: A cross-discipline study on teacher and student perceptions. *Journal of University Teaching & Learning Practice*, 18(4).
<https://doi.org/10.53761/1.18.4.12>
- Elliott, R., Fischer, C. T., & Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *The British Journal of Clinical Psychology*, 38(3), 215–229. <https://doi.org/10.1348/014466599162782>
- Fiske, A., Henningsen, P., Buyx, A. (2019). Your robot therapist will see you now: ethical implications of embodied artificial intelligence in psychiatry, psychology, and psychotherapy. *JMIR*, 21(5): e13216 <https://doi.org/10.2196/13216>
- Følstad, A., Araujo, T., Law, E. L., Brandtzaeg, P. B., Papadopoulos, S., Reis, L., . . . Hobert, S. (2021). Future directions for chatbot research: an interdisciplinary research agenda. *Computing*, 103, 2915–2942.
- Feine, J., Gnewuch, U., Morana, S., & Maedche, A. (2019). A taxonomy of social cues for conversational agents. *ternational Journal of Human-Computer Studies*, 132, 138–161.
- Grischke, J., Johannsmeier, L., Eich, L., Griga, L., & Haddadin, S. (2020). Dentreinc: towards robotics and artificial intelligence in dentistry. *Dental Materials*, 36(6), 765–778.
- Hanson, W. E., Creswell, J. W., Clark, V. L. P., Petska, K. S., & Creswell, J. D. (2005). Mixed methods research designs in counseling psychology. *Journal of Counseling Psychology*, 52(2), 224–235. <https://doi.org/10.1037/0022-0167.52.2.224>
- Health and Care Professions Council. (2023). Practitioner psychologist standards of proficiency. <https://www.hcpc-uk.org/globalassets/standards/standards-of-proficiency/reviewing/practitioner-psychologist---new-standards.pdf> accessed 24/07/23
- Hwang, G., & Chang, C. (2021). A review of opportunities and challenges of chatbots in education. *Interactive Learning Environments*, DOI: 10.1080/10494820.2021.1952615.
- Insider Intelligence. (2022). *Chatbot market in 2022: Stats, trends, and companies in the growing AI chatbot industry*. Retrieved from Insider: <https://www.businessinsider.com/chatbot-market-stats-trends>
- Jovanovic, M., Baez, M., & Casati, F. (2020). Chatbots as conversational healthcare services. *IEEE Internet Computing*, 25(3), 44–51.
- Kennedy, M., & Dunn, T.J. (2018). Improving the use of technology enhanced learning environments in higher education in the UK: a qualitative visualization of students' views. *Contemporary Educational Technology*, 9 (1), 76–89
- Kinsella, B. (2021, June). *UK Smart Speaker Adoption Surpasses U.S. in 2020 – New Report with 33 Charts*. Retrieved February 2022, from Voicebot Research: <https://voicebot.ai/2021/06/18/uk-smart-speaker-adoption-surpasses-u-s-in-2020-new-report-with-33-charts/>
- Marketing Charts. (2021). *Half of US Internet Users Report Smart Speaker Ownership*. Retrieved 2022, from MarketingCharts: <https://www.marketingcharts.com/digital/non-mobile-connected-devices-119306>

- McLeod, J. (2018). *An Introduction to Counselling and Psychotherapy: Theory, Research and Practice*. Maidenhead: Open University Press.
- NHS (2019). The Long Term Plan. <https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf> accessed 24/07/2023.
- Ogilvie, L., Hanley, T., Prescott, J., & Carson, J. (2022). Artificial intelligence in mental health. The novel use of chatbots to support trainee counsellors and recovering addicts. In J. Prescott (Ed) *Digital Innovations for Mental Health Support*. IGI Global. Hershey, Pennsylvania. ISBN13: 9781799879916 | ISBN10: 1799879917 | ISBN13 Softcover: 9781799879923 | EISBN13: 9781799879930 <https://DOI:10.4018/978-1-7998-7991-6.ch013>
- Lee, E.E., Torous, J., De Choudhury, M., Depp, C. A., Graham, S.A., Kim, H-C., Paulus, M.P., Krystal, J.H. & Jeste, D.V. (2021) Artificial intelligence for mental healthcare: clinical applications, barriers, facilitators and artificial wisdom. *Biological Psychiatry Cognitive Neuroscience Neuroimaging* <https://doi:10.1016/j.bpsc.2021.02.001>
- Patel, R. (2021). *AI chatbot development challenges & its future*. Retrieved 2022, from Chatbots Journal: <https://chatbotsjournal.com/ai-chatbot-development-challenges-its-future-4614be2f4c4e>
- Quiroga Perez, J., Daradoumis, T., & Puig, J. (2020). Rediscovering the use of chatbots in education: A systematic literature review. *Computer Applications in Engineering Education*, 28, DOI: 10.1002/cae.22326.
- Sapci, A.H., & Sapci, H.A. (2020). Artificial Intelligence education and tools for medical and health informatics students: Systematic Review. *JMIR Medical Education* <http://mededu.jmir.org/2020/1/e19285/>
- Singh, S., & Thakur, H. (2020). Survey of various AI chatbots based on technology used. *2020 8th International Conference on Reliability, Infocom Technologies and Optimization.*, DOI: 10.1109/ICRITO48877.2020.9197943.
- Smith, K. (2016). Learning from triads: training undergraduates in counselling skills. *Counselling & Psychotherapy Research*, 16(2), 123-131.
- Smutny, P., & Schreiberova, P. (2020). Chatbots for learning: A review of educational chatbots for the Facebook Messenger. *Computers & Education*, 151, DOI: 10.1016/j.compedu.2020.103862.
- Thorat, S., & Jadhav, V. (2020). A review on implementation issues of rule-based chatbot systems. *International Conference on Innovative Computing and Communication*, DOI: 10.2139/ssrn.3567047.
- Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are we there yet? - A systematic literature review on chatbots in education. *Frontiers in Artificial Intelligence*, 4, DOI: 10.3389/frai.2021.654924.

This publication has been deposited in the ULaw Open Access Repository:
<https://ulaw.repository.guildhe.ac.uk/>

Title	Student therapists' experience of learning using a machine client: a proof-of-concept exploration of ERIC (Emotionally Responsive Interactive Client).
Author(s)	Julie Prescott, Lisa Ogilvie and Terry Hanley
Publication Date	Unknown at time of deposit
Acceptance Date	25 July 2023
Deposit Date	15 September 2023
Type	Article
Version	Accepted Manuscript
Publisher	Wiley
Repository URL	https://ulaw.repository.guildhe.ac.uk/id/eprint/9/

Copyright:

This Accepted Manuscript is licenced under a [Creative Commons: Attribution 4.0 \(CC-BY\)](#)

Please note:

An Author Accepted Manuscript (AAM) is the version of the publication that has been peer-reviewed and accepted for publication but has not been subject to final typesetting, formatting, and pagination. It contains the same content as the version of record (final published version), but may differ in layout and appearance.