

Innovations In E-Learning: Using Co-Design to Improve the Usability of an Online Digital Education Tool in Undergraduate Health Sciences

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Abstract

The use of digital technologies in health education has rapidly increased in recent years. The evidence-base for these e-learning technologies has also advanced, but more student engagement in their development is desirable. Clinickit is a comprehensive online learning tool developed to support Health Science students. The aim of this project was to investigate the usability and value of the Clinickit tool. A mixed-methods design in the form of an online survey was used to investigate students' ratings and perceptions of using the digital tool in five areas: ease of use; effectiveness; efficiency; satisfaction; and value. The database and interactive features of Clinickit were all rated by users to be effective and provide satisfaction and value to their study and clinical learning. Open-ended questions provided rich data on the user experience with six main themes emerging: the use of the different function areas in Clinickit; suggestions to improve; positive feedback and potential of the product; specific issues with use; the user interface; and comments related to learning. As a preliminary study into the user experience of an innovative online education tool, the findings here support the idea that users and software developers can benefit from formative investigations which engage students to test usability and improve educational tool design. Further research is needed to incorporate other stakeholder experiences and perspectives, including university lecturers and health clinicians.

Keywords: Health education, E-Learning, Educational technology; User evaluation; Digital technology.

Introduction

E-learning platforms have been now used for decades in higher education (HE). While the use of digital technologies in health education is not new there are mixed outcomes emerging about their effectiveness and usability. Extended Reality (XR) incorporates virtual, augmented or mixed reality simulated training environments and has been identified as an adoptable innovation to improve curricula in public health (Lee & Takenaka, 2022), nutrition (McGuirt et al., 2020), and medical education (Barteit et al., 2021). Since the pandemic especially, there has been a call for more research into the effectiveness and impacts of XR in undergraduate professional and interprofessional health education (Donovan et al., 2021).

There are identifiable benefits to using XR in health education, such as allowing students to learn anatomy or biomedical procedures in an accessible and adaptable environment, and it has been suggested that adoption may be increased by improving staff and student engagement in the development and implementation process (Zweifach & Triola, 2019). A review of usability issues and methods used to evaluate e-learning platforms in HE found that usability attributes measured were

mostly related to effectiveness, satisfaction, efficiency, and perceived ease of use (Abuhlfaia & Quincey, 2018).

At the same time, there is an unrelenting desire for alternative approaches in health care and the population use of complementary and alternative medicine (CAM) including Chinese medicine (CM), has been found around the world and in Australia to be consistent and in demand by consumers (Xue et al., 2007; Harris et al., 2012; Steel et al., 2018). CM is a theoretical and clinical system made up of traditional modalities including acupuncture, tai chi, and herbal medicine, which have been used for thousands of years (National Centre for Integrative and Complementary Health, 2023).

As the first regulated CAM practise in Australia, CM holds a leading role in the fields of CAM and allied health. The level of entry to the profession reflects this with a tertiary level approved program of study required, along with ongoing continuing professional development and other practice requirements legally enforced by the Australian Health Practitioner Regulation Authority (AHPRA), the national

registration agency for health care practitioners (Australian Health Practitioner Regulation Authority, 2023). With high expectations of practitioners' education and demand for CM health care services expected to continue, it is important that education providers offer students and graduates the highest quality resources and tools to support students and subsequent graduates practise in CM.

Chinese medicine (CM) education varies from country to country. Six tertiary institutions offer undergraduate and/or postgraduate level qualifications in CM in Australia and at 30th June 2022 there were 4,839 registered CM practitioners with AHPRA in Australia (Chinese medicine board of Australia, 2022). CM curricula is still largely delivered as face-to-face learning with some education institutions including those in Australia using blended learning approaches, integrating some online subjects. Research into the preparedness of CM students for clinical practice in Australia found that final year CM students perceived themselves to be only "somewhat adequately" or "adequately" prepared for various aspects of future practice (Moore et al., 2010). This suggests room for improvement in CM curricula.

A key part of responsible educational practice is to innovate in learning. Innovative online learning tools that incorporate feedback or self-assessment may assist CM students in their learning and development of lifelong learning skills. Self-assessment is the process of allowing students to evaluate their own work based on a prescribed set of requirements, to improve (McMillian & Hearn, 2008). Research suggests self-assessment fosters intellectual growth and prepare students for lifelong learning, developing the ability to self-critique and reflect on their performance to ascertain if they are meeting particular requirements or standards (Johnson & Gelfand, 2013; Logan, 2015). There are very few online learning tools for CM students that incorporate self-assessment and aid them in their self-study. There is therefore a clear need for usable, online resource to support innovative curricula and assist CM students in their study, develop independent learning skills and support their practise of CM.

The Clinickit Resolve Solutions (2023) is an online learning tool developed to address a gap in the market for online educational tools that may assist CM students in studying the complex medical system of CM, covering both acupuncture and Chinese herbal medicine. It contains a comprehensive fully interactive database of Chinese herbs, formulas, acupuncture points, syndromes, pulse and tongue diagnoses. Based on key discipline texts, it provides comprehensive information about Chinese herbs and herbal formulas, including side effects and potential herbal and pharmaceutical interactions. There are 3D interactive anatomical models for students to learn anatomy alongside acupuncture channels and points. It has a detailed search function and a treatment assistant function to enable the user to design and compare treatment options, as well as an education area where students and teachers can generate individualised quizzes to test their learning.

The conduct of this formative usability study into the Clinickit, before its release into the education market, was conducted in CM students to allow us to understand its value as a learning tool for CM students, as well as provide feedback to the developers on key usability issues and how they might further refine the tool. The aim of this project therefore was to investigate the value and usability of the Clinickit tool to CM students, including how the tool may be improved.

Materials and Method

Study Design

This study was a 'formative usability study' designed to give feedback on the Clinickit online education tool. Since this education tool is still in its formative stages, a formative rather than summative usability study design is more appropriate. The study design addresses those common usability attributes identified in other evaluations of e-learning platforms in HE, i.e. effectiveness, satisfaction, efficiency, and perceived ease of use (Abuhlfaia & Quincey, 2018).

Formative usability studies are conducted to evaluate the product design, identify any shortcomings, and make recommendations to further improve or refine a product (Tullis & Albert, 2013). A formative usability study asks the following types of questions:

- What are the most significant usability issues that are preventing users from completing their goals or that are resulting in inefficiencies?
- What aspects of the product work well for users?
- What do users find frustrating or difficult?
- What are the most common errors or mistakes users are making? (Tullis & Albert, 2013).

The study was a mixed-methods design in the form of an online survey of students which was conducted after students had access to and actively used the Clinickit for at least nine weeks during one trimester of their study. The survey addressed the key objectives of the study relating to usability of the Clinickit, and assessment of satisfaction with the tool and perceived value as a study aid.

Research Aims and Hypotheses

The overall aim of this project was to investigate the usability and value of the Clinickit tool to CM students, including how the tool may be improved.

Drawing on Tullis and Albert's (2013) theoretical framework for planning usability studies, the primary objective was:

To investigate the usability of the Educatr by investigating the following:

- Perceived ease of use: How easy is the Educatr (CM) to use? What do users find frustrating or difficult?
- Effectiveness and efficiency: Is the Clinickit efficient and effective as a study tool? What aspects of the Clinickit work well for users and what aspects don't work well? What are the most common errors or mistakes users are making when using the Clinickit?

Secondary objectives were to investigate:

- Perceived level of satisfaction with the Clinickit
- Perceived potential value of the Clinickit to CM students as a learning tool.

Recruitment and Sampling

Approval for the research project was granted by Torrens University Australia (TUA) Human Research Ethics Committee (Ref 0149). Volunteer sampling method was used and Chinese medicine students in each of the unit of study cohorts in year 1, 2, 3 and 4 were invited to participate from 15th February 2022 via an online class announcement to inform them of the research project. Students could choose to attend an optional information session and receive details about the project. Students had up to week ten of trimester to consider their participation and return the participant information and consent form to the study coordinator electronically using the form provided. The anonymous online survey was closed on 7th November 2022.

Instrument Design

This survey contained 19 quantitative (predominantly Likert) and 15 qualitative (open-ended) questions. Quantitative questions were designed based on Albert and Tullis (2013) and Finstead (2010). It was divided into five main parts and designed to take around 20 minutes to complete: Part A Ease of use; Part B Effectiveness; Part C Efficiency; Part D Satisfaction; and Part E Value (See Appendix 1).

Data Analysis

Descriptive analysis was conducted, and categorical data presented as percentages and frequencies. Open-ended questions were analysed using thematic analysis (Guest et al., 2013), using NVivo. Thematic analysis was carried out using the method suited to ‘concurrent design’ whereby themes arising from the data are systematically coded and categorised. To assure the trustworthiness of the data, data checking was conducted. The rigour of the analysis was supported by having the results checked by the research team by reviewing a sample of surveys. One researcher independently checked the coding from the responses for five of the main categories, with 90% agreement. The remaining codes and themes were discussed by the two researchers until complete agreement on these was reached.

Results

A total of 31 of the 96 Chinese medicine students enrolled at TUA in 2022 participated (response rate of 32%). The majority (83.87%) of respondents identified as female with the remaining identifying as male. 61.29% (n = 23) of respondents are between the ages of 25-44 years. Respondents were spread evenly across the year levels of their CM degree, with only slightly more respondents being in their fourth year of study. See Table 1.

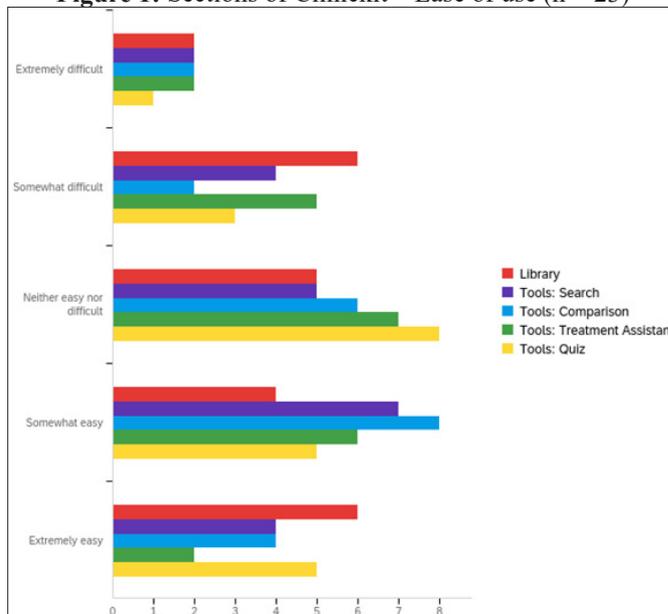
Table 1: Demographics

Gender	%	Year Level in Degree	%
Female	83.87%	Year 1	22.58%
Male	16.13%	Year 2	25.81%
Prefer not to specify	0.00%	Year 3	22.58%
Total (n = 31)	100%	Year 4	29.03%
		Total (n = 31)	100%
Age group (years)	%		
18-24	6.45%		
25-34	32.26%	Study load	%
35-44	41.94%	Full-time student	51.61%
Over 45	19.35%	Part-time student	48.39%
Total (n = 31)	100%	Total (n = 31)	100%

Quantitative Results

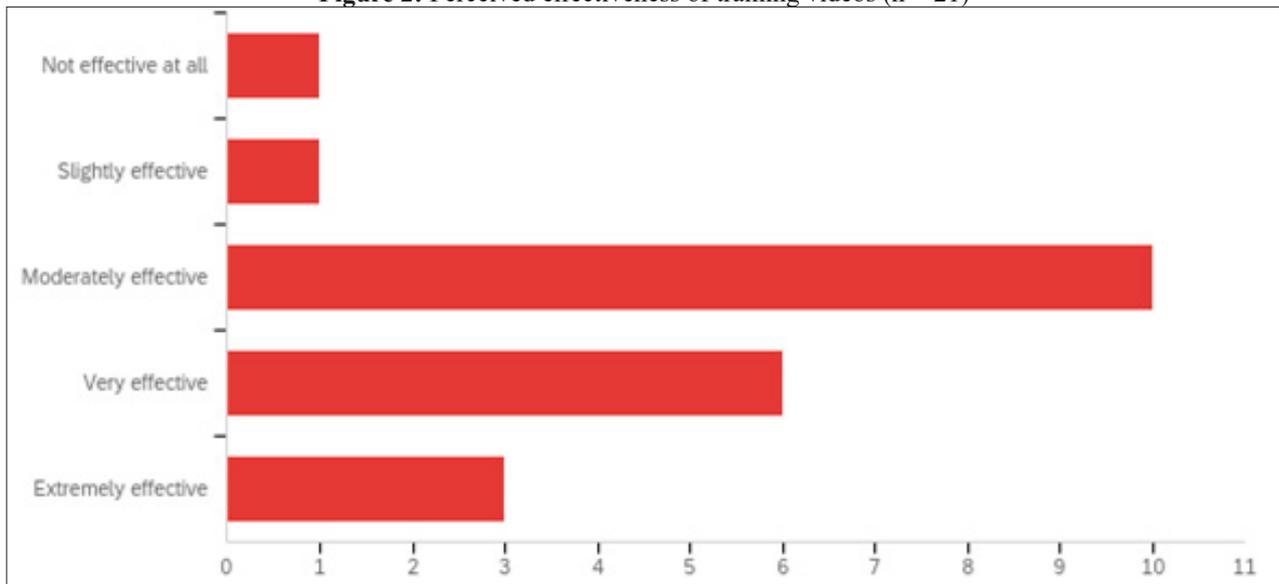
Ease of use: Most respondents reported Clinickit to be extremely easy to neither easy nor difficult to use overall (67%, n=16 respondents). The Search and Comparison tools were most commonly rated as ‘somewhat easy’ (n = 16) to ‘extremely easy’ (n = 8), however the Library was the highest rated as ‘extremely easy’, with six respondents rating it as such (total respondents n = 23) (See Figure 1). At the same time, the Library was also seen as the most rated ‘extremely difficult and ‘somewhat difficult’ (n = 8), with the Treatment Assistant tool the second most rated as difficult (n = 7). The Quiz tool was rated the highest as ‘neither easy nor difficult’ (n = 8), which is supported by participants descriptions of using the Quiz tool in the qualitative responses.

Figure 1: Sections of Clinickit – Ease of use (n = 23)



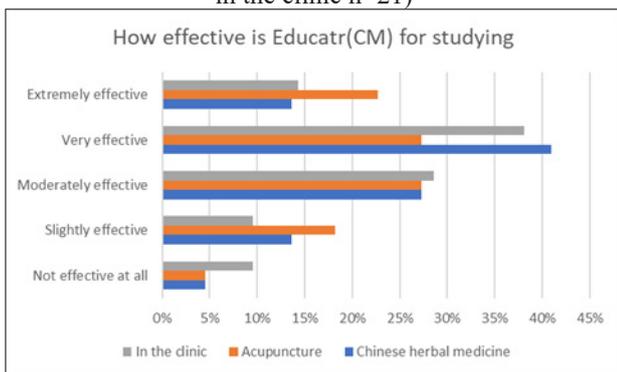
Effectiveness: Of the 21 respondents to this question, 90.48% reported the training videos to be moderately effective or higher, in helping them to use the software (n = 19) (Figure 2).

Figure 2: Perceived effectiveness of training videos (n = 21)



When asked specifically ‘how effective is the Clinickit as a study tool for studying Chinese herbal medicine?’, approximately 55% of respondents answered it is ‘very effective’ or ‘extremely effective’ (n = 12), whilst a further 41% indicated it was ‘slightly effective’ or ‘moderately effective’ (n=9). Responses were more spread when asked, ‘how effective is Clinickit as a study tool for studying acupuncture?’, with fewer respondents rating it as ‘very effective’ (27%, n = 6) and overall responses dispersed across the ‘effective’ response options. When asked to rate how effective Clinickit is as a study tool for use in the clinic, 80.96% of students who responded to the question rated it as ‘moderately effective’ or higher, with 38.10% rating it as ‘very effective’ (n = 8). See Figure 3.

Figure 3: Perceived effectiveness of Educatr (CM) for studying (Chinese herbal medicine n=22; acupuncture n=22; in the clinic n=21)



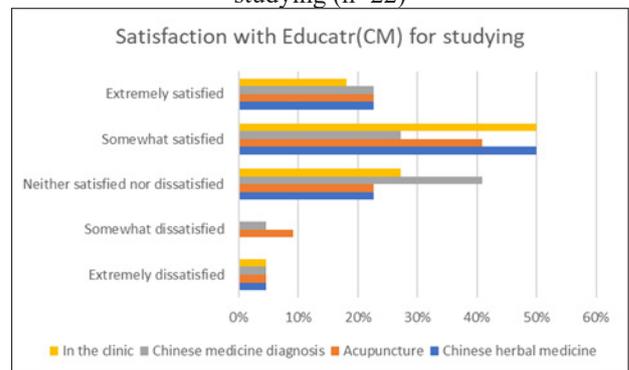
Efficiency: The majority of participants reported Clinickit as ‘moderately’ to ‘extremely efficient’ (73.91%, n = 17).

Satisfaction: Overall, participants were satisfied with using Clinickit as a study tool. Most participants were ‘somewhat’ or ‘extremely satisfied’ with using Clinickit as a study tool for studying Chinese herbal medicine (77.73%, n = 16). Only one respondent gave a dissatisfied response to this question.

Participants were slightly less satisfied with Clinickit as a study tool for acupuncture, with two respondents choosing to reported being ‘somewhat dissatisfied’. Nonetheless, 63.63% (n = 14), were ‘somewhat’ or ‘extremely satisfied’ with Clinickit as a study tool for acupuncture, in response to this question.

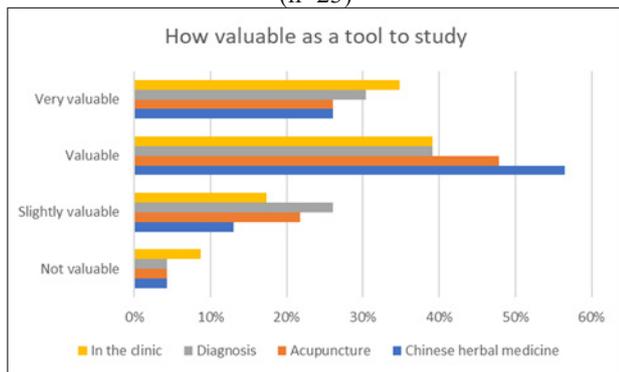
40.91% (n = 9) of respondents were ‘neither satisfied nor dissatisfied’ as a study tool for Chinese medicine diagnosis. More respondents were ‘somewhat satisfied’ or ‘extremely satisfied’ with its use as a study tool for use in the clinic (68.18%, n = 15). See Figure 4.

Figure 4: Perceived satisfaction with Educatr (CM) for studying (n=22)



Value: In two separate questions, respondents overwhelming rated Educator (CM) as valuable to their study of Chinese herbal medicine (95.65%), acupuncture (95.65%), and Chinese medicine diagnosis (95.65%). Clinickit was rated only slightly less valuable for use in the clinic (91.30%), still an extremely high value rating (See Figure 5).

Figure 5: Perceived value of Educatr (CM) as a study tool (n=23)



Qualitative Results

There were 15 open-ended questions in the survey which collected qualitative data. Around half the respondents (depending on the question) provided answers in the open-ended questions. The main themes which emerged from

the open-ended responses were (in order of most prevalent responses from the qualitative analysis): Use of the different Function areas in Clinickit; Suggestions to improve; Positive feedback and potential of the product; Specific issues with use - including bugs or errors and slow to use; The user interface - including design and navigation; Comments related to student's learning.

Functions

Out of all the functions asked about in the survey, the respondents described their experience with the search strategy the most frequently (39 responses). Responses were mixed in terms of ease of use and many participants described specific issues they had with finding and using the search function, as well as suggestions for improvement. The next most described function was the Comparison function (29 responses). Respondents who reported using the function overall had a positive experience. Key quotes from participants can be seen in Table 2.

Table 2: Key Quotes

Theme	Key Quotes
Functions	<i>'The comparison function was much easier for me to use and really helpful. I used it for comparing pulse qualities and loved the results! In fact I tried a few comparisons and really liked this function. As a student, this is really helpful for gaining depth out of learning.'</i> <i>'I found the Comparison function easy to use and visually appealing and didn't experience any frustration.'</i> <i>'the ability to find formulae to fit specific disharmonies, and symptom patterns to match disharmonies is a great boon'</i>
Effectiveness and Efficiency	<i>"fasten the internet responding speed and modify the interface"</i> <i>"an upgrade in the web design and more transparency in the layout, with direct hyperlinks to topics would make it far more time efficient"</i>
The User Interface	<i>'Improve the user-friendliness of the UI to make it easier and more intuitive to use'</i> <i>'the "view" button being relegated to the upper-right hand side of the UI near the settings and logout button was deeply frustrating'</i> <i>'I really like the idea of the Educatr CM, unfortunately just not the execution. I think it needs to be updated to be more user friendly and have better graphics, as it is confusing to look at and sort through'</i>
Comments related to learning	<i>"I think this Educatr (CM) would be useful when I'm starting clinical observation and practice. It would be great if there is an opportunity to give this another try next year."</i> <i>"There is a lot of amazing content condensed into Educatr(CM) and I think given a more friendly user upgrade it would be beneficial to all TCM students, at the moment I think it works best for students who have an understanding and are familiar with topics they are searching for."</i>
Positive feedback	<i>'I love it!'</i> <i>'I can see this program being great for use in running a clinic and with some improvements an invaluable study aid for CM students.'</i> <i>'I think for a work in progress its going really well, the content is all there, the quizzes are great and with a little more fine design I think it would be a vital study tool for students, especially if it could one day become an app. I really do hope this makes its full potential because its like a TCM bible with everything you need all in one space'</i> <i>'I think it's got a lot of potential to be a brilliant and very helpful resource!!'</i>

Participants were less likely to have reported using the Treatment Assistant function, however 29 qualitative responses referencing this function were received. Respondents reported that the tool was slow to use and navigate. For example, one participant said, *'The find a replacement herb in a given formula is a very useful clinical tool to have access to, if only it were easier to navigate.'*

When asked how difficult or frustrating the Quiz function is or how it can be improved, respondents who used the Quiz function reported positively overall or gave suggestions for how that function can be improved (26 references).

Effectiveness and Efficiency

Participants were asked three open-ended questions regarding the effectiveness of Clinickit. The main themes that emerged in the responses to these questions include suggestions for improvement, positive feedback and the user interface.

Responses to the open-ended question that followed asking, 'how could the efficiency be improved?', were varied across themes. The main categories that emerged in this question were participants experience of the software being 'slow', and issues or suggestions to do with the 'user interface'. Key quotes that exemplify these categories from these questions can be seen in Table 2.

The User Interface

As one of the most referenced themes emerging from the qualitative analysis, the importance to participants of the user interface to the usability of CLinickit: Educatr Edition was clear. Emotions related to this theme that were described include frustration and confusion. See Table 2 for key quotes that exemplify this theme. Participants who described their experiences of the user interface discussed difficulties with navigating the program and made suggestions for improvement of the design, including making it more visually appealing and intuitive.

Suggestions for Improvement

Throughout the open-ended question areas there were 57 responses that gave suggestions for improvement, the most referenced theme to emerge.

Some of the responses describing issues such as bugs or glitches then went on to offer a suggestion as to how it may be addressed and so, in examining these, potential areas to improve can be found.

Specific suggestions for improvement included:

- Making the Search function clearer especially layout and user options
- Improving the UI to make it more intuitive and easier to navigate
- Make the website design visually more appealing
- Provide more detailed help options and 'how to' examples
- Review and add content or links in places
- Consider improving speed and offering more formats i.e., an app
- Offer more training that may be subject specific (with discipline experts or lecturers)

Comments Related to Learning

It was clear that students were interacting with this software with their learning of CM in mind. Participants made a number of enthusiastic and suggestive comments that led to this finding emerging, and there was a good deal of overlap between comments in this and other themes, such as comments on the various functions and the potential of the tool.

Key quotes emphasize the contextual and ongoing nature of learning and support the recommendation that this software

has potential to support student's clinical learning are found in Table 2.

Positive feedback and the potential of Clinickit

It was clear from the responses that for many respondents, they would like to use the Clinickit in the future and find great value in it. This supports the findings from the quantitative survey questions. Feedback that was positive and indicated the perceived potential of the product was one of the main themes to emerge from the qualitative analysis. The quotes which exemplify this are in Table 2.

Discussion

As a preliminary study into the user experience of an innovative online education tool, the findings here support the idea that users and software developers can benefit from formative testing investigations such as this one. The database and interactive features of Clinickit including the comparison function and treatment assistant tools were all rated by users to be effective and provide satisfaction and value to their study and clinical learning. Engagement with student needs, perspectives and experiences in the design of the learning environment have been recognised to be especially important since the increase in online delivery of higher education as a result of the COVID-19 pandemic (Stone, 2021; Kluge et al., 2023). Improving the quality of online learning in CM is now seen as an imperative for higher education providers (Zhou et al., 2022; Zhang et al., 2020). Digital technologies such as virtual reality (VR) employed in CAM education settings have increased a great deal and are argued to be increasing in relevance as the digital health era advances (Guan et al., 2022).

In CM education, VR has been developed to support the teaching of acupuncture and moxibustion therapies (Rao et al., 2020). The use of three-dimensional visualisation technologies to teach anatomy to medical students has been found to be effective (Yamine & Violato, 2015). A study observing the effect of combining interactive teaching methods with the virtual anatomy Visible Body platform in teaching meridians and acupuncture points found it improved learning and student satisfaction (Chen et al., 2019). This has been supported in this study, where users reported that Clinickit: Educatr (CM), which has a 3D visual anatomic model to support learning acupuncture points in conjunction with anatomy, is effective in studying acupuncture and was rated with high user satisfaction.

Online methods such as virtual diagnosis in CM have also begun to be examined in the literature (Kim et al., 2019). Novel techniques such as investigating the use of virtual stimulation in learning the sensation of needling force feedback with acupuncture point Fengchi (GB20) have also been reported (Jiang et al., 2013). XR has been found to have potential not just to be as effective in teaching medicine as traditional methods but also more cost-effective in delivery (Curran, et al., 2023). With the uptake of blended learning delivery models in tertiary education, the requirements of academic quality remain and there are challenges especially in the regulated health care professions where self-directed and on-demand

learning modes must be balanced with regulatory requirements such as clinical skill development, inter-professional learning opportunities and work-integrated learning (WIL) experience. It is argued the use of XR in education needs continued validation and the adoption of a learner-centred pedagogical approach (Logeswaran et al., 2021).

The principles of co-design underpinned the approach taken to developing, implementing and interpreting this survey of potential end-users of the Clinickit. Co-design refers to 'the conception or creation of artefacts drawing on a shared vision, social learning and mutual understanding among all key stakeholders' (Salomao et al., 2013). It takes into account that fact that all involved in the design process may have different perspectives and expectations which should be considered. In the field of social design, co-design is 'a plan or method to do something' which places beneficiaries in positions of power and influence in the design and implementation process (Murcott, 2007; Salomao et al., 2013). Co-design by incorporating user feedback, such as was used in this study, is one method of potentially ensuring quality at the same time as improving usability and supporting student engagement.

In the health care professions, while varying globally in definition, higher education and continuing professional development have been identified as key elements in not only the attainment of specialised professional knowledge but also the acquisition of professional attributes and behaviours (Cruss et al., 2019; Goddard & Brockbank, 2023). Innovative and usable study tools such as Clinickit may help bridge the gap between the learning of theory and discipline knowledge and the practise of effective professional and clinical skills in the practice environment, now considered essential in the health care professions and expected in current health care systems today.

As an online digital learning tool, Clinickit has been described by users as a valuable study tool, in relation to their learning of acupuncture, Chinese herbal medicine, diagnosis, and as a study tool in the clinic. The use of a digital study tool such as Clinickit in the clinical education and WIL setting can help students to directly connect learning to practice. Employing self-assessment methods, such as the self-designed practise quizzes tested in this study, can help students self-directed learning and scaffold knowledge relevant to clinical practice and educational assessment. Within the current debate of curriculum and assessment design related to artificial intelligence and academic integrity (Perkins, 2023; Ouyang et al., 2022), educational tools such as Clinickit may help in tracking engagement with formative assessment practise and embed resources within an online tool to help us deal with some of the challenges to education presented by artificial intelligence (Swiecki et al., 2022).

Limitations to this study include the pilot design and small sample size. The Clinickit was tested out in current Chinese medicine student population at the Melbourne campus of Torrens University Australia. Responses in terms of behaviour

and perspectives around software use are not necessarily generalisable to other populations. It is recommended that future studies be conducted in larger and other student populations. The experiences and perspectives on this innovative online study tool and its effects on educational and user-rated outcomes should be sought from teachers and practising clinicians in future research.

Conclusion

The findings from this study reflected the identified theoretical frameworks for studies into usability. The survey results demonstrate that primary and secondary objectives of the research were met, with participants describing Clinickit as easy to use, effective and efficient in supporting their CM studies. Clinickit was also found to show levels of satisfaction with respondents and was seen as a valuable addition to their study resources.

Very importantly, the Clinickit meets the needs of students to be effective and valuable in supporting their studies of CM.

The research project has identified several areas for refinement of future versions of the Clinickit which should be easily implementable as a part of the co-design process. Ongoing iterations of the software should be tested out within a broader and larger population which includes students from other institutions, as well as lecturers and practitioners.

Importantly, this research project was an example of co-design in action, whereby stakeholders (that is, users) play an integral role in the testing process. This approach represents an important model for conduct of research in education that is gaining increasing acceptance within the healthcare sector.

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About You

- Gender : Female Male
 Prefer not to specify
- Age group : 18-24 25-34
 35-44 Over 45
- Year Level : Year 2 Year 3
 Year 4
- Study : Full-time student
 Part-time student

Part A. Ease of Use

Q1. On a scale of 1-5 how easy is the Educatr(CM) to use overall?

1= very difficult, 2 = difficult 3 = neither difficult nor easy, 4 = easy, 5 = very easy

Q2. Rate the sections of Educatr(CM) on a scale of 1-5 in terms of ease of use:

Section of Educatr(CM)	Rating 1= very difficult, 2 = difficult 3 = neither difficult nor easy, 4 = easy, 5 = very easy
Library	
Tools: Search	
Tools: Comparison	
Tools: Treatment Assistant	
Tools: Quiz	

Q2. What did you find frustrating or difficult about using the Library? Please describe.

Q3. What did you find frustrating or difficult about using the Search function? Please describe.

Q4. How could the Search function be improved?

Q5. What did you find frustrating or difficult about using the Comparison function? Please describe.

Q6. How could the Comparison function be improved?

Q7. What did you find frustrating or difficult about using the Treatment Assistant function? Please describe.

Q8. How could the Treatment Assistant function be improved?

Q9. What did you find frustrating or difficult about using the Quiz function? Please describe.

Q10. How could the Quiz Function be improved?

Part B. Effectiveness

Q11. How effective were the training videos in assisting you to use the Educatr(CM)? Rate how effective the training videos were in assisting you to use the Educatr(CM).

1= very ineffective, 2 = ineffective 3 = neither ineffective or effective 4 = effective 5 = very effective

Q12. How could the training videos be improved? Please describe, specifying particular videos and how they can be improved, or additional videos you would like added.”

Q13. How effective is Educatr(CM) as a study tool for studying Chinese herbal medicine? Rate how effective Educatr(CM) is as a study tool for studying Chinese herbal medicine:

1= very ineffective, 2 = ineffective 3 = neither ineffective or effective 4 = effective 5 = very effective

Q14. How effective is Educatr(CM) as a study tool for studying acupuncture? Rate how effective Educatr(CM) is as a tool for studying acupuncture:

1= very ineffective, 2 = ineffective 3 = neither ineffective or effective, 4 = effective, 5 = very effective

Q15. How effective is Educatr(CM) for use in the clinic? Rate how effective Educatr(CM) is as a study tool for use in the clinic:

1= very ineffective, 2 = ineffective 3 = neither ineffective or effective, 4 = effective, 5 = very effective

Q16. What aspects of the Educatr(CM) work well?

Q18. What aspects of the Educatr(CM) didn't work well? For example, were there common errors or mistakes you made when using the Educatr(CM)?

Q19. How could you improve Educatr(CM) so that it is more effective?

Part C. Efficiency

Q20. How (time) efficient is the Educatr(CM) to use overall? Rate the level of efficiency of Educatr(CM) overall:

1= very inefficient 2 = inefficient 3 = neither inefficient or efficient 4 = efficient 5 = very efficient

Q21. How could the efficiency be improved?

Part D. Satisfaction

Q22. How satisfied are you with the Educatr(CM) as a study tool for studying Chinese herbal medicine? Rate how satisfied you are with Educatr(CM) is as a study tool for studying Chinese herbal medicine:

1= very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied or satisfied 4 = satisfied 5 = very satisfied

Q23. How satisfied are you with the Educatr(CM) as a study tool for studying acupuncture? Rate how satisfied you are with Educatr(CM) is as a study tool for studying acupuncture:

1= very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied or satisfied 4 = satisfied 5 = very satisfied

Q24. How satisfied are you with the Educatr(CM) as a study tool for studying Chinese medicine diagnosis? Rate how satisfied you are with Educatr(CM) is as a study tool for studying Chinese medicine diagnosis:

1= very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied or satisfied 4 = satisfied 5 = very satisfied

Q25. How satisfied are you with the Educatr(CM) as tool for use in the clinic? Rate how satisfied you are with Educatr(CM) is as a tool for use in the clinic:

1= very dissatisfied, 2 = dissatisfied, 3 = neither dissatisfied or satisfied 4 = satisfied 5 = very satisfied

Part D. Value

Q26. How valuable is the Educatr(CM) as a study tool for studying Chinese herbal medicine? Rate the value of Educatr(CM) as a study tool for studying Chinese herbal medicine:

1= not valuable 2= slightly valuable 3= valuable 4= very valuable

Q27. How valuable is the Educatr(CM) as a study tool for studying acupuncture? Rate the value of Educatr(CM) as a study tool for studying acupuncture:

1= not valuable 2= slightly valuable 3= valuable 4= very valuable

Q28. How valuable is the Educatr(CM) as a study tool for studying Chinese medicine diagnosis? Rate the value of Educatr(CM) as a study tool for studying Chinese medicine diagnosis:

1= not valuable 2= slightly valuable 3= valuable 4= very valuable

Q29. How valuable is the Educatr(CM) as a tool for use in the clinic? Rate the value of Educatr(CM) as a tool for use in the clinic:

1= not valuable 2= slightly valuable 3= valuable 4= very valuable

Q30. Do you have any other feedback you would like to give about the Library, given it is a work in progress?

Any Other Comments?

Thank You For Your Participation

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