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Transversal competency development in healthcare professionals: A scoping literature review to identify effective educational paradigms, principles and strategies

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Transversal competency development in healthcare professionals: A scoping literature review to identify effective educational paradigms, principles and strategies

Abstract

Transversal Competencies (TCs) (interpersonal, intrapersonal, critical thinking and global citizenship skills) are essential skills, knowledge and behaviours for work and life success. Limited literature exists on methods to develop TC for adult education. This scoping review explores how TCs are being embedded into health professional learning and strategies to deliver training for the self-directed learner.

Practitioner Notes

1. Learners can be taught transversal competencies to self-manage, solve problems, relate and collaborate with others.
2. Teaching methods can be aligned with the learner's objectives through selecting appropriate principles and paradigms of education.
3. Heutagogy was found to be effective for changing attitudes and practice in self-directed, independent learners (online).
4. Adult learners who wish to improve their practice and drive change need transformative education rather than compliance teaching.
5. Educators are encouraged to consider progressing beyond social constructivism and humanism paradigms towards transformative learning to enable learners to lead change in society.

Keywords

transversal competencies, adult learning, heutagogy

Introduction

The COVID-19 pandemic has affected the way we learn and work. Health professionals at the frontline against the pandemic continue to require essential competencies to manage during turbulent times. Throughout a health professional's career, they require competencies to deal with the unexpected changes that are intrinsic to the health system. With the pandemic fast-tracking the uptake of self-directed, independent training options such as online learning, it is worth exploring the types of capabilities needed around managing unexpected situations and the methods of learning that can support this important workforce and its new graduates (Zalat et al., 2021). This scoping literature review aims to examine such competencies and effective learning methods required for our future health workforce.

Definitions and theoretical constructs

Health professionals in this review refer to the group defined by the World Health Organization (WHO) as those who 'conduct research; improve or develop concepts, theories and operational methods; and apply scientific knowledge relating to medicine, nursing, dentistry, pharmacy, and promotion of health' (Maeda & Socha, 2018).

As health professionals continue to face disruption in their workplace and lives, it is imperative to identify the essential competencies they require to resiliently manage work and life aside from occupation specific skills and knowledge. Numerous terms such as 21st century skills, transversal skills, communication and teamwork, self-awareness and socio-cultural sensitivity are referred to in the literature as critical for building and maintaining health professional resilience (Maeda & Socha, 2018; Maeda & Socha, 2021). Transversal Competencies (TCs) were selected as a concise and easily referenced term for this review. Published by UNESCO after international consultation, it acknowledges and incorporates the various terms and frameworks around 21st century skills, and have been specifically constructed for application in education (Care et al., 2019). TCs continue to be recognized globally as an essential lever in education for 'future proofing the workforce' by the European Commission, OECD and World Economic Forum (Whittemore, 2018). It needs to be incorporated into education and delivered in a way that suits the increasingly independent learner in our current era (Whittemore, 2018).

The UNESCO definition contains six TC domains (critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, media, and information literacy and other) (see Figure

1). The first four of the TC domains were employed as constructs to inform the search terms used in this review. The fifth domain (media and information literacy), although critical for health professional learners, was not scoped for this review as it is generally taught at school (prior to undertaking health professional qualifications). For example, the Australian curriculum requires students to ‘develop Information and Communication Technology (ICT) capability as they learn to use ICT effectively and appropriately to access, create and communicate information and ideas, solve problems and work collaboratively in all learning areas at school and in their lives beyond school’ (Australian Curriculum, n.d.). The sixth domain of ‘other’, continues to evolve (previously skills and competencies as defined by countries in 2016, to health and religion in 2019) (Care et al., 2019; UNESCO, 2016).

Educating current and future health professionals

Health professional education refers to the formal training undertaken to develop skills and competencies, as students or practicing health professionals, to function in their field of qualification (*Health Professions Education: A Bridge to Quality.*, 2003; Knox et al., 2017). This education commences in higher education (commonly university) and spans across continuing professional education through various avenues (e.g., certified courses, vocational training) (Hays et al., 2020). Programs are currently designed in compliance with workplace and regulatory requirements, with curricula content reflecting professional practice domains e.g. clinical components (Hays et al., 2020). With COVID-19, there has been an increasing reliance on online education prompting more independent learning (Tertiary Education Quality and Standards Agency, 2020). Continuing professional education has also seen a rise in self-directed learning (Curran et al., 2019). Health professional learners are commonly adults, possibly with prior knowledge related to TCs, capable of self-directed learning.



Figure 1
Transversal competencies (TCs) with domains and definitions

Source. Care et al. (2019).

Frameworks exist to guide health professional education (Hays et al., 2020). Given that the purpose of this review is to explore how TCs are currently delivered in health professional education, and discuss potential strategies for development, reference will be made to published adult learning principles (pedagogy, andragogy and heutagogy) for context. Pedagogy, andragogy and heutagogy

are used in relation to health professional education to describe the way knowledge is delivered in relation to the maturity of the learner (new to the subject, adult/mature and self-directed) (Halupa, 2015)(Chacko, 2018). As the learner develops, so does the role of the teacher. Educational strategies for each phase of the learner’s maturity is depicted in Figure 2.

Classroom	Lab/Field	Hospital/ Community	Attend CME	Engage in CPD
Interactive Lecture	Teacher supervised experiential learning	Apprenticeship, shadowing care provider	Podcasts by experts	Care Gap analysis & Personal Professional Development (PPD)plan
Group discussion & Demonstration	Site visit	Real patient encounters ambulatory setting	CME Lectures, Workshop	Deliberate & Reflective practice & learning how to learn
Case-based learning, Flipped classroom	Computer-Assisted learning	Real patient encounters in special setting	Gap Analysis Learning contract	CPD Workshop series, Blended learning
Assignments, Study guide, Module-based learning,	Projects, Lab Museum, Guided discovery using Johari window	On the job learning & teaching	<ul style="list-style-type: none"> • Web 2.0 and Social medial enabled learning, “mobile learning”, “Virtual Philosopher”, incorporating critical reflection on learning • Collaborative Learning in Communities of Practice within the specialty & in care teams • Fellowship & Distance learning programs chosen by professional for self - development 	
Problem based learning (PBL)	Descriptive learning portfolio	Reflective learning portfolio		
Integrated Teaching, System, organ-based	Inter-professional team learning	Team learning in health delivery systems	Learning journals Critical reflection	High fidelity Simulation labs: Practice & receive technology assisted haptic feedback
Observation/revision in Simulation lab	Practice & receive feedback in Simulation lab	Practice & receive feedback in Simulation lab	Targeted Professional development courses	

CME: Continuing Medical Education CPD: Continuing Professional Development

Figure 2
Andragogy to heutagogy

Source. Chacko (2018).

The learning progression of a health professional learner can be described in phases through the paradigms of education (Baker et al., 2019) (see Figure 3). Learners new to a subject are taught knowledge and behaviours by teachers. As they mature, their cognitive abilities develop, allowing them to evaluate their learning and understand how to apply their knowledge. More advanced learners can build and even create new knowledge. This can be constructed through social interaction with fellow learners, actualised through reflection, and even taught by the learner themselves to create change (transformative learning).

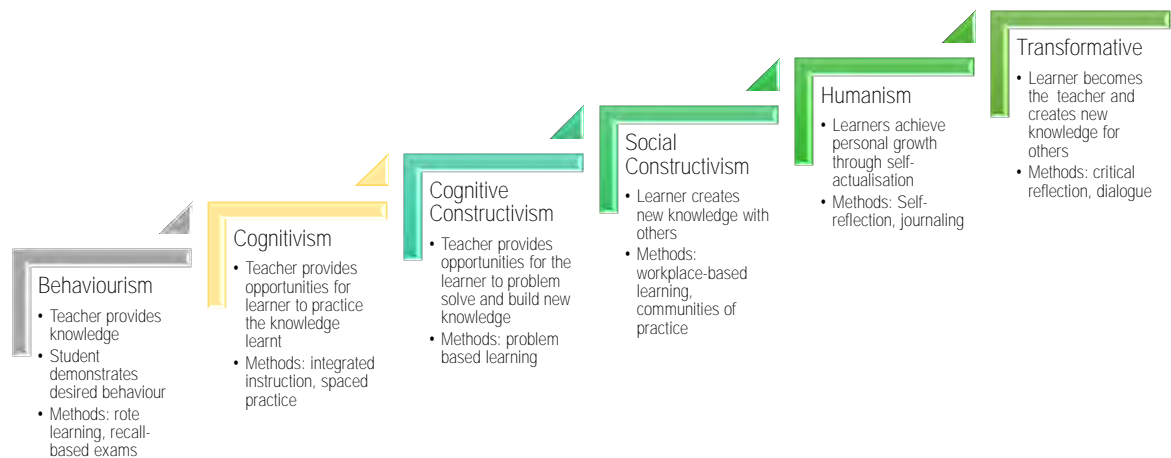


Figure 3
Paradigms of education.

Adapted from Paradigms of education, by Ng et al. (2018).

Figure 4 depicts a learner’s progression through the principles and paradigms of education from a heavily involved, teacher-directed learning where students are new to the subject (pedagogy); to less involved, self-directed learning for more mature students with prior knowledge (andragogy). Finally, where transformative learning occurs, learner-directed principles (heutagogy) can be used to guide the type of education relevant to a mature, self-directed learner, able to identify their own knowledge gaps and learning objectives (Stoszkowski & Collins, 2017; Hase, 2016).

Given the critical and ongoing need for health professionals at all stages of their learning journey to be equipped with transversal competencies, the objective of this review is to explore existing methods of education for transversal competencies in health professional learners. The discussions in this review will be framed by the terms and constructs defined above. The review of current research and outcomes related to this objective will provide a useful starting point to explore options for how these critical skills can be taught. It is envisaged that the findings from this review will be of value to both learners and educators interested in developing critical competencies through teaching methods that align with the maturity of the learner.

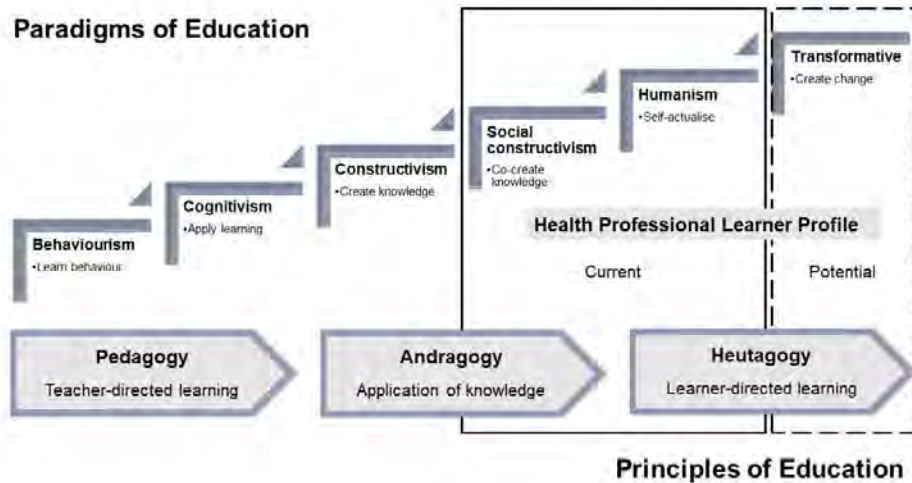


Figure 4
The principles and paradigms of education

Method

Protocol

A scoping literature review was employed to better understand the existing methods of education related to delivering transversal competencies to health professional learners. This methodology was suitable for an initial exploration into the extent of transversal competency education for health professional learners in order to identify research gaps and future research in this area (Peters et al., 2015). As per the published protocol for scoping reviews developed by the Joanna Briggs Institute (JBI), the research objective, questions and methods were defined prior to the review being conducted by two reviewers (Peters et al., 2015). The search strategy was informed by the JBI three step search strategy and Pickering’s systematic quantitative literature review process (Peters et al., 2015; Pickering et al., 2015). Search terms were tested using a single database associated with education and health (Scopus), then refined based on the relevance of the results to the objective and scope of this review before a second search across all databases relevant to the subject matter (Scopus and Ebscohost). The number of publications identified, screened, included and excluded were reported through the Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) with the assistance of Covidence® software (see Figure 5) (Moher et al., 2009; Veritas Health Innovation) (Moher et al., 2009). Scientific rigor and reproducibility were achieved through the thematic analysis process of reviewing the literature multiple times against the constructs defined in the introduction of this paper and cross-validation by a second reviewer (Fereday and Muir-Cochrane, 2006). As this was a literature review, ethics approval was not required.

Research questions

Applying an inductive approach, the research questions that underpin this review are:

1. What are the essential transversal competencies for health professionals that could be developed (or mapped) through education and/or training?
2. What teaching and educational interventions are currently used to support the development of transversal competencies?
3. What educational principles and paradigms are relevant to health professional education in relation to transversal competencies?

Search terms

The Population or Problem, Interest, Context (PICo) model was used to structure the initial search terms in context to the definitions stated in the introduction section and research questions of this review (RMIT, 2019). The search terms used for the population were “health professionals”, “health work*” and “health manage*”. Following the “test” stage the initial search terms for transversal competencies (transversal competencies, skills, interpersonal, intrapersonal, global citizenship, critical and innovative thinking) were broadened, incorporating the terms used to define the transversal competency domains (see Figure 1) and associated terms (non-academic, generic, or general and 21st century). For consistency and rigor, the searches across multiple databases were undertaken by the first author on a single date.

Eligibility

Only published and peer reviewed articles were included. Given the narrow research topic and population, all study designs and both empirical and non-empirical studies (except for reports and commentaries) were accepted (Table 1). Publications that were full-text, peer reviewed academic journals, in English across the date range 2013 to 2017 (within five years of the review date) were included. This date range was selected to reflect contemporary educational principles and design, acknowledging the continued evolution in this field of study.

Table 1*Summary of findings from the identified studies (n=17)*

Study	Method	Type	Data collection	Quality rating	Learner type	Discipline	Intervention	Description of intervention	Educational interventions	Context
Abdulmajeed et al. (2015)	Non-empirical: Review	Not-applicable	Review	Low	Undergraduate	Multidisciplinary	Games	Educational games for health professional training	1) Games 2) Group interaction e.g. discussions)	Group
Balalian et al. (2014)	Qualitative	Cross-sectional	1) Interviews 2) Focus groups	High	Working professional	Doctors	Training programme	Professional Development (PD) curriculum adapted to learner's environment	Workplace based training	Group
Carmichael et al. (2018)	Quantitative	Pre-test and post-test without control group	Questionnaire	High	Undergraduate	Allied Health	Required course	Emotional Intelligence (EI) development during university course	Reflective practice	Group
Deepak et al. (2014)	Qualitative	Cross-sectional	1) Feedback 2) Observation	Low	Working professional	Allied Health	Professional development	Professional Development (PD) curriculum adapted to learner's environment	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Group interaction e.g. discussions	Group
Fejzic et al. (2015)	Mixed-methods	Pre-test and post-test without control group	1) Feedback 2) Questionnaire	High	Undergraduate	Allied Health	Simulation	Simulations to improve professional practice	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Group interaction e.g. discussions 3) Role-play/simulations	Group
Fernandez et al. (2014)	Quantitative	Pre-test and post-test without control group	Questionnaire	High	Working professional	Multidisciplinary	Fellowship	Leadership development	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Group interaction e.g. discussions 3) Reflective practice 4) Technology based e.g. online, internet	Individual, Group
Gendron, et al. (2013)	Mixed-methods	Pre-test and post-test without control group	1) Observation 2) Questionnaire 3) Interviews	High	Working professional	Other	Professional development	Cultural awareness training for health professionals	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Group interaction e.g. discussions 3) Role plays/simulations	Group
González-Hernando et al. (2013)	Quantitative	Pre-test and post-test without control group	Questionnaire	Low	Undergraduate	Nurses	Undergraduate course	Self-directed learning for health professionals	Problem-Based Learning	Individual
Kavanagh, et al. (2014)	Quantitative	Cross-sectional	Review	High	Working professional	Multidisciplinary	Professional development	Application of leadership training	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Workplace based training	Individual, Group
Kenefick, et al. (2014)	Mixed-methods	Pre-test and post-test without control group	Questionnaire	High	Working professional	Other	Professional development	Online training for health professionals	Technology based e.g. online, internet	Individual
Lovell, et al. (2013)	Mixed-methods	Post-test without control group	Questionnaire	Low	Working professional	Doctors	Simulation / role play	Simulations to improve professional practice	1) Role-play/simulations 2) Group interaction e.g. discussions	Group
Matovu, et al. (2013)	Non-empirical: Review	Not-applicable	Review	Medium	Working professional	Multidisciplinary	Workbased learning	Work-based training	1) Instructor led e.g. lectures, demonstrations, coaching, mentoring 2) Workplace based training	Group
Moores, et al. (2017)	Non-empirical: Review	Not-applicable	Review	High	Graduate	Allied Health	Supervision, support and ongoing education	Graduate transition strategies	1) Reflective practice 2) Workplace based training	Individual, Group
Muir, et al. (2014)	Qualitative	Cross-sectional	Focus groups	High	Undergraduate	Multidisciplinary	Reflection	Reflection to change practice	1) Technology based e.g. online, internet 2) Reflective practice	Individual
Olufowote (2015)	Qualitative	Cross-sectional	Interviews	High	Educator	Doctors	Workbased learning	Strategies for teaching virtue	1) Workplace based training 2) Group interaction e.g. discussions 3) Instructor led e.g. lectures, demonstrations, coaching, mentoring 4) Reflective practice	Individual, Group
Perry, et al. (2015)	Mixed-methods	Post-test without control group	Questionnaire	Low	Undergraduate	Nurses	Simulation / role play	Cultural competence in health professionals	1) Technology based e.g. online, internet 2) Reflective practice 3) Role-play/simulations	Group
Shanta, L., & Gargiulo, L. (2014)	Quantitative	Pre-test and post-test with control group	Review	High	Undergraduate	Nurses	University students	No evidence of differences in EI development between the two compared programs.	Not specified	Not stated

Screening of results

Results were screened by title, abstract, then full-text as per the PRISMA protocol (see Figure 4).¹⁹ After the first author refined the initial search results through title and abstract, the first and third authors both screened the full-text articles against the agreed inclusion and exclusion criteria to ensure reliability and validity. The reference lists of the selected articles were screened by title until saturation had been achieved. Articles related to specific clinical interventions, those that did not discuss educational methods or covered learning that did not include transversal competencies were excluded from this review.

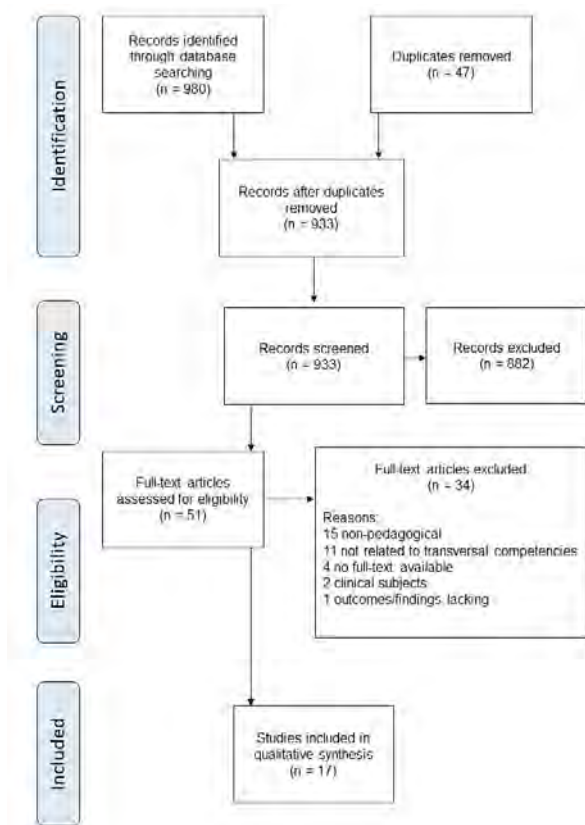


Figure 5
PRISMA flowchart for the selection of studies

Quality assessment of results

The quality of the identified publications was assessed using the Mixed Methods Appraisal Tool (MMAT) by Hong for empirical studies, adapted to include the Authority, Accuracy, Coverage,

Objectivity, Date and Significance (AACODS) checklist (see Figure 6 and Table 1) (Hong et al., 2018; Tyndall, 2010).

The AACODS checklist is designed to enable evaluation and critical appraisal of grey literature.

The Fourth International Conference on Grey Literature held in Washington, DC, in October 1999 defined grey literature as: "that which is produced on all levels of government, academics, business and industry in print and electronic formats, but which is not controlled by commercial publishers."

Grey literature includes theses or dissertations (reviewed by examiners who are subject specialists); conference papers (often peer-reviewed or presented by those with specialist knowledge) and various types of reports from those working in the field. All of these fall into the "expert opinion"

Critical appraisal is "the process of carefully and systematically examining research to judge its trustworthiness, and its relevance and value in a particular context" (Burls 2009)

Grey (unpublished) studies and RCTs should be appraised using the same tools as their black (published) counterparts.

AACODS		YES	NO	?
Authority	Identifying who is responsible for the intellectual content. Individual author: <ul style="list-style-type: none"> • Associated with a reputable organisation? • Professional qualifications or considerable experience? • Produced/published other work (grey/black) in the field? • Recognised expert, identified in other sources? • Cited by others? (use Google Scholar as a quick check) • Higher degree student under "expert" supervision? Organisation or group: <ul style="list-style-type: none"> • Is the organisation reputable? (e.g. W.H.O) • Is the organisation an authority in the field? In all cases: <ul style="list-style-type: none"> • Does the item have a detailed reference list or bibliography? 			
Accuracy	<ul style="list-style-type: none"> • Does the item have a clearly stated aim or brief? • Is so, is this met? • Does it have a stated methodology? • If so, is it adhered to? • Has it been peer-reviewed? • Has it been edited by a reputable authority? • Supported by authoritative, documented references or credible sources? • Is it representative of work in the field? • If No, is it a valid counterbalance? • Is any data collection explicit and appropriate for the research? • If item is secondary material (e.g. a policy brief of a technical report) refer to • the original. Is it an accurate, unbiased interpretation or analysis? 			

Coverage	<p>All items have parameters which define their content coverage. These limits might mean that a work refers to a particular population group, or that it excluded certain types of publication. A report could be designed to answer a particular question, or be based on statistics from a particular survey.</p> <ul style="list-style-type: none"> • Are any limits clearly stated? 			
Objectivity	<p>It is important to identify bias, particularly if it is unstated or unacknowledged.</p> <ul style="list-style-type: none"> • Opinion, expert or otherwise, is still opinion: is the author's standpoint clear? • Does the work seem to be balanced in presentation? 			
Date	<p>For the item to inform your research, it needs to have a date that confirms relevance</p> <ul style="list-style-type: none"> • Does the item have a clearly stated date related to content? No easily discernible date is a strong concern. • If no date is given, but can be closely ascertained, is there a valid reason for its absence? • Check the bibliography: have key contemporary material been included? 			
Significance	<p>This is a value judgment of the item, in the context of the relevant research area</p> <ul style="list-style-type: none"> • Is the item meaningful? (this incorporates feasibility, utility and relevance) • Does it add context? • Does it enrich or add something unique to the research? • Does it strengthen or refute a current position? • Would the research area be lesser without it? • Is it integral, representative, typical? • Does it have impact? (in the sense of influencing the work or behaviour of others) 			

Figure 6. Authority, Accuracy, Coverage, Objectivity, Date and Significance (AACODS) Checklist (Tyndall, 2010)

Data analysis and synthesis

The data extracted from the literature was analysed against published frameworks and bibliometric parameters. Data was extracted from each paper and discussed with reference to the constructs of transversal competencies, educational principles (pedagogy, andragogy, heutagogy), and the paradigms of education (behaviourism, cognitivism, constructivism, social constructivism, humanism, transformative) (see Figure 3). Inductive thematic analysis was employed to extrapolate codes relevant to the research questions. Themes were then extracted from the coded text through systematic text condensation strategy (initial impressions from the identified literature, identifying

and sorting text into code, condensing codes to meaningful categories and synthesizing descriptions and concepts into themes). (Malterud, 2012). Bibliometric analyses were employed to account for discipline specific authorship and citation practices (Doja et al., 2014). The H-index and journal quality impact factors were used as bibliometric parameters to analyse the academic productivity of the lead authors for each identified article through Scopus (Choudhri et al., 2015).

Results

A total of 17 papers that identified teaching and learning methods that effectively supported the development of transversal competencies were included in this review. The process of article selection is shown in Figure 5.

Can transversal competencies be taught to health professionals?

Transversal competencies were referenced in 16 of the 17 identified studies in this review. Table 2 describes the different educational interventions used with reflection and social (group) learning with peers noted across multiple competency domains.

Table 2

Educational interventions for transversal competency education for health professionals from the identified studies.

	Critical and innovative thinking	Interpersonal skills	Intrapersonal skills	Global citizenship
Total mentions	n=10, 59%	n=15, 88%	n=9, 53%	n=8, 47%
Educational interventions	<ul style="list-style-type: none"> • Problem-based learning • Reflective activities 	<ul style="list-style-type: none"> • Role play • Simulations • Groupwork 	<ul style="list-style-type: none"> • Self-reflection with peer feedback 	<ul style="list-style-type: none"> • Cultural education • Resources to support cultural interaction • Simulated scenarios, videos to promote understanding and empathy of different cultures • Groupwork and problem-based learning where team-based collaboration is required

Interpersonal skills

Interpersonal skills were mentioned in 15 (88%) of the 17 studies, with over half of these (n=8), related to non-clinical professional development. Educational methods that promoted communication, teamwork and collaboration included group learning activities such as problem or project-based tasks, or simulations, that reflected scenarios in the health professional's workplace e.g. facilitated group discussions after the participants observed the events that occurred in the scenarios, role-play and presentations, peer coaching and professional networking. Confirming the value of developing interpersonal skills in health professionals, the study by Fejzic and Barker (2015) determined that simulations that facilitated group interactions, resulted in improved professionalism, confidence, and cooperation with peers.

Critical thinking

Critical thinking in health profession education is associated with decision making and problem solving in consideration of factual evidence and social justice (Negri et al., 2017; Kahlke & Eva, 2018). The study by Muir et al. (2014) found that critical thinking fostered improved professional practice when participants reflected on current processes and related lessons learnt with improved future practice (Muir et al., 2014). Nine of the 17 studies described critical thinking in relation to reflective thinking, analysis, problem solving and risk management in relation to overcoming barriers to health service delivery. Six of the studies involved professional development education. Reflective practices such as analysing or discussing lessons learnt during workplace-based projects and developing and implementing any resulting improvements were employed in five of the nine courses evaluated in the identified studies.

Intrapersonal skills

Intrapersonal skills identified by Carmichael et al. (2016) as self-awareness, self-management, social awareness, and relationship management were identified in nine of the 17 (53%) studies reviewed. Five of the studies attributed course outcomes to increased professional confidence, self-efficacy, and self-management. These were associated with improved professional practices such as:

- effective communication with peers when discussing clinical observations,
- improved ability to resolve conflicts in workplace-based scenarios, and
- empathetic treatment of patients.

These findings were reported in both types of cohorts studied, university students and working professionals. Learning environments that promoted independent self-reflection facilitated by social interaction e.g. peer discussion and feedback were conducive to the development of intrapersonal skills. The study by Fernandez et al. (2014) incorporated both elements, with the most significant improvements being self-awareness and communication skills based on pre and post self-assessments by participants. The leadership fellowship program evaluated in this study combined different learning environments and study interventions e.g. individual and group work through face to face and online forums in distance and residential settings. Facilitated learning e.g. executive and peer coaching, and mentoring, was integrated with individual development plans, journaling, and self-assessments. In addition, course modules were customized to the knowledge gaps identified by the learner themselves.

Global citizenship

As a result of increased cultural awareness, participants described global citizenship in terms of being able to communicate, collaborate and relate better with others in eight (47%) of the 17 studies. Two of these studies evaluated courses or modules specifically related to cultural competency education for health professionals. Participants reported that problem-based tasks helped them learn how to collaborate and negotiate with others in a group (González-Hernando et al., 2013). Education on diverse cultures and the beliefs of their members alongside simulated interactions delivered through online and face to face forums (group discussions and educational games) resulted in empathy, sensitivity, and compassion in participants. Furthermore, participants reported communicating in a more culturally sensitive manner than prior to their training and utilized available resources e.g. translators in their workplace (Perry et al., 2015).

Effective learning methods for transversal competency development

The use of engaging learning experiences featured more frequently than traditional didactic, classroom-based teaching approaches where transversal competencies were noted (Deepak et al., 2014; Matovu et al., 2013). Problem-based interventions were employed in 89% (n=8) of the nine studies that involved critical and innovative thinking. Importantly, six of these studies advocated engaging techniques such as debates and quizzes that provided learners with more immediate and frequent feedback than traditional lecture-based teaching (Abdulmajed et al., 2015). Reflective learning activities allowed learners to create new knowledge and evaluate alternative ways to handle situations (Lovell et al., 2013). The study by Balalian et al. (2014) highlighted the importance of

simulating real-life scenarios in health professional training to enact similar psychological and behavioral responses as they would experience in the high-pressured, life-critical environments they worked in. Opportunities for participants to observe and interact in realistic scenarios, then discuss or consider lessons learnt in relation to their own beliefs and actions were shown to be valuable for improving future practice (Muir et al., 2014; Lovell et al., 2013).

The development of interpersonal skills was associated with learning activities that allowed participants to practice communicating and interacting with peers and patients using work-based scenarios. Negotiation, conflict resolution, consultation and empathetic communication were common themes discussed in the 15 studies that involved interpersonal skills. Fejzic and Barker's (2015) study identified significant improvement in the practice skills and professionalism of pharmacy students using simulations that reflected interpersonal interactions commonly experienced by the cohort. Students and actors performed the scripted role-plays facilitated by teachers using six scenarios: 1) seeking assistance from peers, 2) expressing disagreement, 3) participating in a group, 4) receiving feedback from patients, 5) refusing a request from patients for medication, and 6) providing constructive or negative feedback (Fejzic & Barker, 2015). Overall, simulations (briefing, role-plays, facilitation, and debriefing) and groupwork (reflection, feedback, and negotiation) were found to be effective learning methods for interpersonal skill development in eleven (n=11) of the 14 studies.

As with interpersonal skill development, all eight of the identified studies where students reported developing intrapersonal skills involved work-based learning methods (i.e. clinical placements, workplace demonstrations, simulated interactions with patients, observations of qualified health professionals interacting with patients). Students who observed and experienced outcomes of different interactions and conflicts through role-play, identified how they could better manage their emotions and assertiveness with patients and peers (Fejzic & Barker, 2015). Personal and peer coaching, online leadership journaling, personal leadership impact projects and development plans were strategies employed in a leadership program where participants self-reported significant improvements in self-awareness, and emotional intelligence (Fernandez et al., 2014). To promote motivation and self-regulation in students, problem-based learning needed to be challenging, interesting, important, and useful for their professional future (González-Hernando et al., 2013).

The most varied teaching and learning methods were associated with global citizenship. Learning that developed empathy for diversity and cultivated awareness, tolerance and inclusivity were

delivered online or face to face in individual and group settings. Videos that prompted emotional responses and empathy for a diverse population group were employed in three of the eight studies identified with global citizenship development. An online program on communicating and treating patients with inadequate language skills was developed based on the critical attributes for effective simulation: 1) creating a hypothetical opportunity e.g. to adopt the virtual role of a health professional, 2) authentic representation e.g. learning content that reflected the clinical context of the learner, 3) active participation e.g. engaging learning activities such as video, audio, photo albums, quizzes and feedback, 4) integration e.g. providing downloadable resources such as best practice summaries and contact lists to the learner throughout the course, and 5) repetition, evaluation and reflection through branching scenarios (Perry et al., 2015). The provision of resources and references (e.g. helpful links and contacts) was discussed in two of the studies, to support the health professional to deliver culturally sensitive services (Perry et al., 2015; Gendron et al., 2013).

Adult learning principles of education applied in the identified studies

Educational principles were extrapolated from 16 of the 17 studies reviewed with six studies describing more than one principle (see Table 3).

Of the three principles of education (pedagogy, andragogy and heutagogy) used to frame this review, adult learning approaches (andragogy) were most frequently identified (n=12) (see Table 3). All the educational interventions investigated in these 12 studies focused on competency development of health professional and non-technical skills (transversal competencies) reflective of the developmental emphasis of andragogy (Stoszowski & Collins, 2017). Throughout these studies, three recurring themes reflecting andragogic principles were identified: 1) self-assessment and reflection against personal experiences, 2) peer-discussion around a work-related scenario or experience, and 3) facilitation in the form of coaching or mentoring.

Seven studies described educational approaches that reflect heutagogy for the purpose of developing health professional capabilities. All but two of these studies^{33,45} integrated andragogy and pedagogy with heutagogy using blended methods containing didactic lectures on new knowledge alongside self-directed learning journals and problem-based group activities (Carmichael et al., 2016; Olufowote, 2015). Five study cohorts were comprised of senior adult learners i.e. doctoral fellows, working health professionals and those holding leadership positions in the health system (Muir et al., 2014; Fernandez et al., 2014; Balalian et al., 2014; Gendron et al., 2013; Kavanagh et al., 2014).

Four of the studies describe improving professional confidence and capabilities to advocate systemic change through critical awareness, self-reflection, personal development, and collaborative decision making (Fernandez et al., 2014; Balalian et al., 2014; Kavanagh et al., 2014; Olufowote, 2015). Double-loop learning was evident in four studies where learners reported modifying their behavior because of metacognitive reasoning (Blaschke, 2012; Muir et al., 2014; Gendron et al., 2013; Olufowote, 2015; Kavanagh et al., 2014). Changes to attitudes and professional practice resulted from interventions that provoked empathy in learners, motivating change to their belief systems (Gendron et al., 2013; Kavanagh et al., 2014; Olufowote, 2015).

Table 3*Principles of education by study*

Study	Principles of education		
	Pedagogy	Andragogy	Heutagogy
Abdulmajed et al		x	
Balalian et al			x
Carmichael et al		X	
Deepak et al	x	X	
Fejzic and Barker	x	X	
Fernandez et al	x	X	x
Gendron et al	x	X	x
González-Hernando et al		X	
Kavanagh et al	x	X	x
Kenefick et al	x	X	
Lovell et al		X	
Matovu et al		x	x
Moore and Fitzgerald			
Muir et al			x
Olufowote			x
Perry et al		x	
Shanta and Gargiulo			
Grand Total	6	12	7

Pedagogy was employed in six of the total sixteen identified studies (37%). Across all six studies, part or all the educational programs investigated were structured, mandatory and assessed (Kenefick et al., 2014; Fejzic & Barker, 2015; Fernandez et al., 2014; Deepak et al., 2014; Gendron et al., 2013; Kavanagh et al., 2014). Learners were required to complete modules to develop foundational knowledge or where they lacked minimum educational qualifications (Fernandez et al., 2014;

Deepak et al., 2014; Kavanagh et al., 2014). The cohorts in these studies ranged from university students (16%, n=1) to working professionals and leaders (83%, n=5) (Fejzic & Barker, 2015).

Paradigms that supported health professional learning

Humanism (58%, n=10) and social constructivism (52%, n=9) were the most frequently identified paradigms of education as described by Baker et al. (2019) (see Table 4). Both paradigms were found in seven (41%) studies. The humanistic paradigm was reflected where interventions focused on promoting self-actualization and personal development in the learner through self-reflexivity (e.g. portfolios and journaling) and self-directed learning (Fernandez et al., 2014; González-Hernando et al., 2013; Kavanagh et al., 2014). Perspectives from the social constructivist paradigm were evident with group settings to promote co-learning based on workplace scenarios (e.g. simulations and role plays followed by group discussion) (Fejzic & Barker, 2015; Lovell et al., 2013).

One study that employed educational games reflected cognitive paradigms as behavioral changes could not be confirmed without testing the games for validity and reliability, and monitoring of progress (Abdulmajed et al., 2015). Five studies reflected cognitive constructivist education that enabled learners to independently translate existing knowledge into new skills. Problem-based learning was reported to facilitate cognitive construction as students organized their own learning resources and developed new knowledge through group debate (Kavanagh et al., 2014).

Two studies reflected behaviorist interventions where the learner was assessed for behavioral changes as evidence of their learning. Multiple choice questionnaires and feedback were employed in educational games and an online course to improve clinical knowledge and promote culturally sensitive clinical practice. Transformative learning was evidenced in four (23%) studies where learners described changes to their personal beliefs motivating them to become change agents.

Study	Paradigms of education					
	Behaviourism	Cognitive	Cognitive constructivism	Social constructivism	Humanism	Transformative
Abdulmajed et al		X				
Balalian et al			X	X	X	
Carmichael et al					X	
Deepak et al			X	X		X
Fejzic and Barker				X	X	
Fernandez et al				X	X	X
Gendron et al	X					
González-Hernando et al			X		X	
Kavanagh et al						X
Kenefick et al			X			
Lovell et al				X	X	
Matovu et al			X	X		
Moores and Fitzgerald				X	X	
Muir et al				X	X	
Olufowote				X	X	X
Perry et al	X					
Shanta and Gargiulo					X	
Grand Total	2	1	5	9	9	4

Table 4 *Paradigms of education by study*

Discussion

Health professionals work in an ever-complex and changing environment and will continue to need TCs to enable them to cope and perform during this pandemic and into the future (Maeda & Socha, 2021; Zalat et al., 2021). TCs are recognized as a global currency for today’s workforce to operate and work and in life and can be learnt (Whittemore, 2018). The results of this scoping review confirm that TCs can be provided through different methods of education. The exploration of the teaching and learning of TCs through the principles and paradigms of education highlights whether existing methods could be better contextualized to the learner’s maturity and capabilities. This is especially pertinent with schools and organisations needing clarity how to best support learner development as they pursue embedding TCs into curricula.

Recognising the abilities of the independent adult learner – andragogy to heutagogy

The studies identified involved learners at university courses to leaders undertaking professional development courses. More than half of these learners were capable of self-directed learning, and

accordingly, most of the interventions in the identified studies focused on skill development through adult learning methods (andragogy) (see Table 3). However, given that learners reported building new knowledge from reflection and self-realisation, could heutagogy be used as a guiding principle to support the development of learner capabilities, beyond competence? Competent learners could be given opportunities to move from applying their knowledge in a simulated or supervised setting to applied practice in their workplace with their teachers as co-mentors rather than facilitators (Chacko, 2018).

Heutagogy is particularly effective where learners have existing qualifications and are capable of learning independently (Chacko, 2018). Health profession education commences at undergraduate level where learners are adults who may already possess TCs. In an andragogic, teacher-led education, the input of the learner is directed, whereas heutagogy promotes proactivity in the learner so they can build knowledge based upon their own experiences (Blaschke & Hase, 2015; Hase & Kenyon, 2000). In the studies reviewed, participants who learnt transversal competencies through heutagogy reported changes in attitudes and practice, understanding reasons for and advocating change to systems or the community, as well as greater sensitivity to delivery of caring responses (Gendron et al., 2013; Olufowote, 2015; Muir et al., 2014; Kavanagh et al., 2014; Balalian et al., 2014).

Throughout the pandemic, learners are becoming more practiced in self-directed learning (Zalat et al., 2021). Heutagogy requires a flexible approach to education that is readily supported by digital technology (Chacko, 2018). Learning online and remotely allows resources to be provided by the educator, while facilitating self-directed learning (Curran et al., 2019). When using digital technology, learners can select specific modules and different formats for learning (audio, visual etc.) and seek additional resources to supplement their knowledge. It was surprising that only three studies reviewed mentioned online learning methods (Kenefick et al., 2014; Fernandez et al., 2014; Perry et al., 2015). Considering the pertinence of heutagogy to health professional education and the growing popularity of digital technology in professional development, further investigation is warranted in this space (Blaschke, 2012).

Beyond compliance to change agents through transformative learning

Health professionals are required to improve their practice, constantly learning how to better themselves to provide high quality care (Institute of Medicine (US) Committee on Planning a Continuing Health Professional Education Institute, 2010). Education that fosters the creation of

change agents to improve societal systems is reflected in the transformative paradigm of education (Baker et al., 2019). Surprisingly, instead of this paradigm, the interventions employed in the studies reviewed focused on social constructivism and humanism, one paradigm short of transformative education. Importantly, improvements to health care services were only reported where transformative learning practices were employed (customized, flexible, and targeted training) (Fernandez et al., 2014; Kavanagh et al., 2014). If health professionals are keen to discover how they can employ transversal competencies to drive change that fosters social improvement, then transformative education is needed.

Strengths, limitations and future research directions

Although most studies were of high quality, two limitations were acknowledged by the authors, these were recall bias from self-reporting and the lack of longitudinal studies for generalization (Fejzic & Barker, 2015; Carmichael et al., 2016; Fernandez et al., 2014; Deepak et al., 2014; Kavanagh et al., 2014; Matovu et al., 2013). Some studies lacked detail when discussing the interventions employed, presenting difficulties for accurate synthesis into the principles and paradigms of education. Some studies also cited limitations around assessment rigor, calling for more specific evaluation tools (e.g. to measure emotional intelligence) or further quantitative research (e.g. randomization, measured outcomes) (Kenefick et al., 2014; Carmichael et al., 2016; Fernandez et al., 2014; Deepak et al., 2014). In consideration of these limitations and to establish transversal competency education that is both informed by evidence and effective, future research is warranted.

The findings of this study can be considered by other professions interested in developing change agents with 21st century work capabilities. Educators should fully utilize the maximum potential of the capable learner especially those motivated to change society. Where the learner profile reflects that of independent and driven professionals, the interventions framed against the higher spectrum of the principles and paradigms of education should be considered.

Practical implications

The findings of this study present the following two lessons for practice:

- Transversal competency education is critical for health professionals to build resilience and manage change in their life and workplace.

- Mature, adult learners can realize changes that can improve their performance through self-reflection and peer discussion. This is informed by the educational principle of heutagogy and paradigm of transformational learning. Such strategies should be incorporated into instructional design models for transversal competency development.

Conclusion

Health professionals will continue to face change and uncertainty beyond this current pandemic. The ability to self-manage, solve problems, relate, and collaborate can be learnt. As TCs continue to be incorporated into school curricula and workplace learning programs, guidance is required to inform the teaching and learning methods that best align with learners as they progress. For educators, viewing the learner through the principles and paradigms of education (see Figure 3) can help to build a better understanding of the stage of learning (paradigm) and suitable educational strategies (principles) to deploy (see Figure 2).

Health professional learners are mature and capable of independent learning. Heutagogy promotes an appreciation for learner-led education. However, most interventions reviewed had not progressed past andragogy. Heutagogy should be referenced to allow learners to go beyond problem solving to enable change through interventions such involving reflexivity and real-life scenarios. In addition, online delivery methods are currently underutilized in transversal competency education, despite the fact they have been shown to support flexible learning and inform the knowledge gap that exists around the effectiveness of learner-led education.

Mature learners value reason and improvement over fact and compliance. However, the interventions studied emphasized knowledge construction and professional development. Given that the role of the health professional is associated with improving societal wellbeing, educators are encouraged to consider moving beyond social constructivism and humanism towards transformative learning. Transformative learning encourages learners to improve, driven by the pursuit of social justice rather than simply understanding how to complete a task. Health professional learners are tasked with improving the lives of others. It would seem fit that they would pursue transformation, which requires movement beyond just gaining knowledge.

Current and potential options for TC education for health professionals have been discussed in this review. Further research is needed to provide an evidence-based to clearly determine if

transformational learning can be achieved through online-based heutagogy. These findings would be integral to supporting educators with applying appropriate interventions across multiple professions.

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