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A review of resilience in higher education: toward the emerging concept of designer resilience

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ABSTRACT

Higher education (HE) students experience rates of depression and anxiety substantially higher than those found in the general population. Many psychological approaches to improving wellbeing and developing student resilience have been adopted by HE administrators and educators, especially during the Covid-19 pandemic. This article aims to review literature regarding integration of resilience and wellbeing in HE. A subsequent aim is to scope toward developing foundations for an emerging discipline specific concept – designer resilience. A literature scoping review is applied to chart various conceptual, theoretical and operational applications of resilience and wellbeing in HE. Twenty-seven (27) articles are identified and analysed. The scoping review finds that two general approaches to implementing resilience and wellbeing training exist in HE. First, articles reacting to a decline in student mental health and remedying this decline through general extra-curricular resilience or wellbeing programmes. Second, articles opting for a curricula and discipline-specific approach by establishing why resilience will be needed by future graduates before developing and testing new learning experiences. The presence of cognitive flexibility, storytelling, reframing and reflection lie at the core of the practice of resilience and design and therefore offer preliminary opportunities to develop 'designer resilience' training. Future research opportunities are identified throughout the article.

Introduction

Higher education (HE) students experience rates of depression substantially higher than those found in the general population (Ibrahim et al. 2013). Scholars go as far as to suggest there is a 'HE mental health crisis' (Shek et al. 2017). This crisis has deepened during the global pandemic where students have faced a significant array of challenges (Lederer et al. 2021).

One avenue for supporting student wellbeing and academic performance in HE is the positive psychology construct of resilience. Broadly defined, resilience is the ability to bounce back from adversity and cope with stress (Southwick and Charney 2018). Psychological resilience is formed through life experiences and acquirable through cognitive and behavioural training (Southwick and Charney 2018). Importantly, resilience acknowledges that adversities, stressors and setbacks are part of life and thus cannot be totally eradicated (Wong 2011). This perspective suits the HE environment as academic stress and setbacks are viewed as part of the transition to becoming a professional (Eisenberg, Lipson, and Posselt 2016).

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Beyond the HE environment, the climate crisis and other grand challenges will require resilient leaders who can orchestrate socio-technical transitions. These leaders will benefit from the presence of psychological capital across a career defined by stressors beyond their control (Luthans, Luthans, and Avey 2014). While problem-solving approaches exist that provide methodological and technical expertise to guide these transitions (Geels 2004), an emphasis on the resilience of the problem solver to thrive in a career addressing wicked problems remains an afterthought. Confronting this afterthought is critical given HE students will grapple with challenges such as 2050 carbon zero goals, United Nations Sustainable Development goals and other global commitments that have thus far presented more rhetoric rather than action.

Why scope to designer resilience?

Design is a field that can positively contribute to addressing ill-defined problems, as designers stimulate integrative action and synthesis of constraints allowing exploration and discovery of new possibilities (Buchanan 1992; Rittel and Webber 1973). Design problems are diverse, yet involve the convergence of human, technology and organisational considerations. A design problem could be to conceptualise Covid-19 'safe' public transportation or to propose services and strategies that enable circular economies. Design is therefore represented in literature as a science of problem solving (Simon 1996) and form of inquiry (Schön 1983; Dorst 2011).

Design involves negotiating uncertainty and ambiguity. Processual uncertainty in design stems from unique theoretical markers; no one correct solution is deducible (Simon 1996), problems and solutions co-evolve (Dorst 2011), the value of proposed solutions are always contestable (Liedtka 2015) and implementing solutions encounters institutional resistance (Klitsie, Price, and Santema 2021). The experiential learning process at the heart of design (Beckman and Barry 2007) requires designers to be reflexive to both technical solutions (Crilly 2015), and higher-order goals (Simon 1996).

As a consequence of these nuances, design education is founded on pedagogical techniques that encourage exploration, creativity and pluralism in the studio setting. In ideal circumstances, design education has transformative potential, producing students who have capabilities, knowledge and skills to bring about important societal changes and positive impact. Design students also learn about their professional design identity – who they are and what values and principles they stand for manifested through their work (Tracey and Hutchinson 2018; Baha, Koch, Sturkenboom, Price and Snelders 2020). In less than ideal circumstances, design educators instruct students to replicate iconic designs with technical precision rather than unlock inner creativity (Baha et al. 2020). These students learn to please superiors and require ongoing instruction. The latter does naught to prepare independent, critical and enlightened new leaders that can drive urgent socio-technical transitions.

Aim and scope

This article aims to review literature concerning the integration of resilience and wellbeing in HE. The article scopes from broad to specific by developing foundations for an emerging concept – designer resilience[1] – that can eventually respond to design-specific adversities previously described. While this article scopes to the emerging concept of designer resilience, there continually lies possibilities for generalisability to other disciplines. These horizontal connections are explored throughout the article given the transdisciplinary audience of this journal.

Method

Scoping literature review

A scoping review is a form of literature review involving multiple structured searches (Levac, Colquhoun, and O'Brien 2010). Peters and colleagues (2015, 141) state of scoping reviews, 'In general,

scoping reviews are commonly used for 'reconnaissance' – to clarify working definitions and conceptual boundaries of a topic or field.' In this article, three structured search cycles are performed. The author of this article with expertise in design research, design education and design practice conducted the review. Prior research on the wellbeing of design students during the SARS-Covid-19 pandemic (Price and Bijl-Brouwer 2021) and the opportunity to shape post-pandemic HE (Bijl-Brouwer and Price 2021) provide additional context for this research.

Research questions and scoping approach

Research questions informing search parameters are:

(1) How are resilience and wellbeing conceptualised in HE literature?
(2) How are resilience programmes operated in HE and what are the benefits and limitations of various approaches?
(3) What are current notions of designer resilience?

Research question one inquires about the conceptual clarity of resilience and wellbeing in HE. This conceptual and descriptive focus aims to develop clarity regarding the various psychological perspectives active in HE that inform wellbeing and resilience. Research question two inquires about the operational and practical use of resilience in HE. This focus probes beyond operational and methodological critique toward establishing the benefits and limitations of general and curricular-specific resilience programmes. Research question three scopes to a design-discipline specific focus on resilience to identify opportunities for the integration of this construct within future educational innovation. Each search builds on the prior, beginning with developing conceptual clarity, identifying operationalisations of resilience, then turning toward opportunities for integration into design education.

Scoping reviews require inclusion criteria in order to regulate data collection and synthesise evidence. Inclusion criteria for selection of articles is as follows:

- Articles offer an empirical, theoretical or conceptual lens of resilience within the context of HE;
- Where the article does not explicitly present resilience in HE, it does present wellbeing in HE;
- Where the article does not present wellbeing or resilience in HE, resilience and or wellbeing are presented in another context that is transferable to HE, for example in learning communities or in primary/secondary education;
- The article is published in a peer-reviewed journal;
- One version of an article is selected, with obvious duplicates of an article excluded. Where an article is more than approximately 30% different (i.e. conference to journal articulations), the article is selected.

The reading of articles is guided by Hart's 'ground rules' for literature review quality (1998). Hart places an emphasis on comprehending the theoretical standpoint, analysing argumentation and checking alignment of evidence. Each search is managed through a summary record sheet where theory, evidence, argumentation and key citations are tabulated (Hart 1998, 146). Tables are between 4000 and 5000 words each and available to the reader upon request to the corresponding author. Research memos are recorded throughout the reading process to ensure preliminary insights are captured.

Systematic and scoping literature reviews are often completed in teams of researchers. In research teams, inter-coder reliability can be established to validate the analyses. This scoping review is conducted by a single researcher and so possible bias-related limitations are present. To mitigate bias in this study, progressive research quality checks have been conducted with a critical reviewer who has extensive experience in executing systematic literature reviews. These progressive

review sessions check quality at each phase of the scoping review process to ensure the method is reliably executed.

Search 1

Key words applied were:

Resilience + higher education + wellbeing

Key words were separated with the Boolean operator and/or. No year of publish parameters were set. Thirty-four (34) databases including ScienceDirect, IEEE databases and JSTOR databases were searched with 187 results returned. Based on title, keyword an abstract scan, twenty-one (21) articles of significance were retrieved. Eleven (11) articles were excluded after full-text reading because a lack of relevance to resilience or wellbeing in HE. Further, one article was removed during full text reading as it related to resilience of built HE infrastructure. The final number of articles selected from Search 1 is ten (10).

Search 2

Search 2 applies a '2017–2021' year parameter and applies the key words:

Higher education + university + college + student + resilience + enhance + program

Boolean operators and/or separate keywords entered. This search protocol is an intentional extension of the work of Brewer et al. (2019), found in Search 1, who applied the same scoping review process in 2007–2017. The intention of extending upon the work of Brewer et al. (2019) is twofold. First, to advance conceptual and theoretical clarity regarding resilience in HE as this was a key recommendation of Brewer and colleagues. Second, because of the changed circumstances of the global pandemic, to identify the most recent literature (Lederer et al. 2021).

Thirty-four (34) databases including ScienceDirect, IEEE databases and JSTOR databases are searched with 181 papers returned. A title and abstract scan of 181 identified papers was conducted. Articles excluded relate to the resilience of technical systems, such as IT platforms in HE. Eighteen (18) articles were retrieved after this scan. Nine (9) articles were excluded after further reading because a lack of relevance to resilience and or wellbeing in HE was established. One paper was excluded during full text reading because it again concerned the resilience of HE built infrastructure, not students. The final number of articles selected from Search 2 is eight (8) articles.

Search 3

Search 3 applies the key search words:

Wellbeing + Resilience + Higher education + Design

Key words are separated by Boolean operators and/or. 34 databases including ScienceDirect, IEEE databases and JSTOR databases were searched. As no articles related to design appeared in either Search 1 or 2, Search 3 kept the recent timeframe constraints of 2017–2021 to maintain a search for most recent articles responding to the mental health crisis acknowledged in HE. The presence of design within the keywords serve to scope the review toward discipline specific literature.

The number of articles returned is 359. 359 articles are title and abstract scanned for relevance to the research questions and inclusion criteria. Articles excluded typically view resilience as part of a technical system under stress. For example, many of the excluded articles examined how specific built infrastructure can remain resilient during disaster. Eleven (11) articles were retrieved after this process, with two articles excluded following further reading due to a focus on the resilience of built infrastructure in HE. The final number of articles selected from Search 3 is nine (9) articles.

Results

As required by Peters et al. (2015, 144) for scoping reviews, a PRISMA diagram of articles is presented in Figure 1. This figure shows the review decision process. A list of reviewed articles is located in Table 1. A full list of article references is accessible in the Appendix. The number of articles excluded through title and abstract reading is evidence to the huge variety of literature. The results of each search are presented in a thematic format addressing the stated research questions. This format synthesises articles to critically compare and contrast, identify gaps in knowledge and reveal opportunities for educational innovation.

Conceptualising resilience and wellbeing in HE

Many diverse definitions of resilience were encountered across the three searches. A convergence in all definitions involved:

- 'Bouncing back' to perform in spite of adversity;
- Undergoing adaption without significant loss of function;
- Growing overtime as a tolerance or 'a thicker skin' to adversities is developed, and;
- Deliberately building peer networks for collective support.

Wellbeing is presented in literature as a more holistic notion of health encompassing psychological, physical, spiritual and social activities of the student. Wellbeing reads as a broad and continuing state
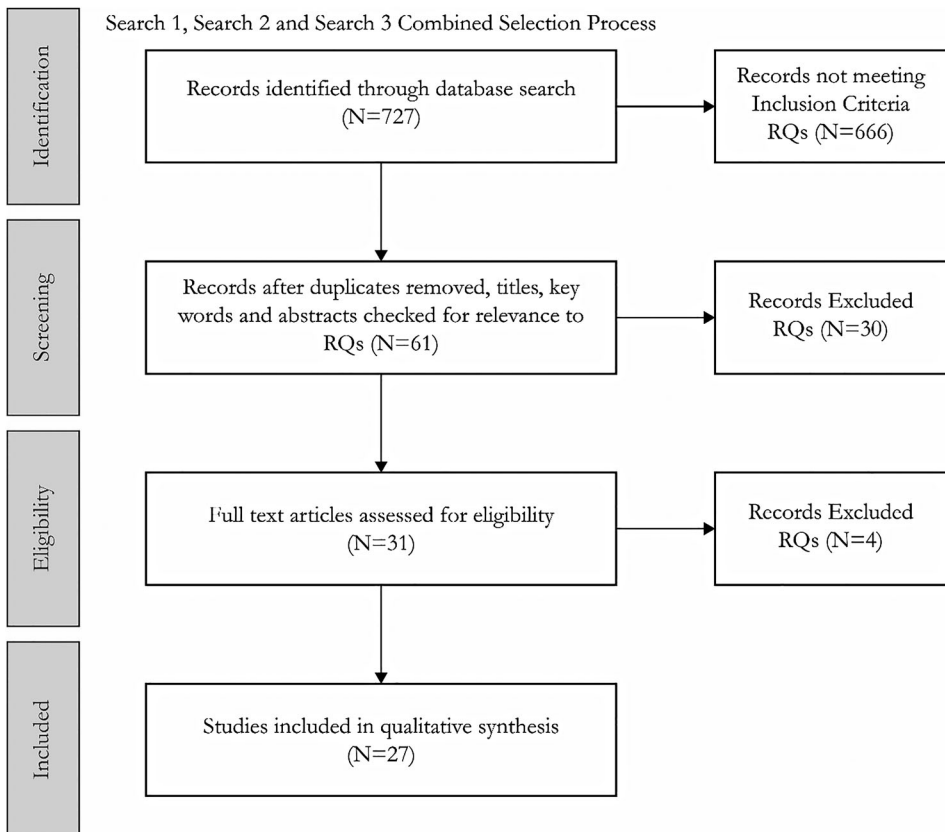

Figure 1. PRISMA flow diagram of review selection process.

Table 1. List of journals reviewed.

Journal no.	First Author Surname	Year	Journal	Article Format/Stand point	Methods
Search 1					
1	Cassidy	2015	Frontiers in Psychology	Empirical/Self-efficacy is a predictor of resilience in HE students	Survey, scenario-based vignettes; post questionnaire
2	Clafferty	2021	AdvanceHE	Conceptual/Students with low resilience are more likely to drop out. What can be done to build resilience?	Interventions with student community to build belongingness and self-belief
3	Duncan	2020	European Journal of Legal Education	Theoretical/The quality of legal education is being eroded by a performance culture stemming from neoliberalism and individualism	-
4	Eisenberg	2016	New Directions in Student Services	Literature Review/Resilience supports student retention and is therefore attractive for HE policy makers	Literature review
5	Kim	2020	Stanford Social Innovation Review	Conceptual/What are twenty-first Century skills for entrepreneurs and 'changemakers'?	-
6	Lederer	2021	Health Education & Behavior	Theoretical/The Pandemic has worsened the existing challenges of marginalised HE students in particular	Systematic literature review
7	Brewer	2019	Higher Education Research & Development	Literature Review/HE Student wellbeing is cause for concern. What available resilience programmes respond to this concern?	-
8	Hogan	2020	International Review of Psychiatry	Theoretical/In times of crisis, solidarity helps us to connect with community. A strong resilient community is comprised of strong resilient individuals	-
9	Turner	2017	Construction Management and Economics	Empirical/How to develop graduates who are ready for the rigours of the construction industry?	Survey; purposive sampling;
10	Robbins	2018	Psychology Teaching Review	Empirical/Early life challenges and trauma will shape us. How is resilience developed from these past events?	Questionnaire
Search 2					
11	Akeman	2020	Depression and Anxiety	Empirical/Assess the benefit a brief yet universal resilience programme for first year college students	Quasi study testing resilience training pre, during and post interventions
12	Feng	2018	Disaster Prevention and Management	Conceptual/How can informal education increase preparedness of communities to natural and human-made disasters?	-
13	Goodenough	2020	Active Learning in Higher Education	Empirical/How to increase the employability of graduates via interns that stimulate resilience?	Quasi study testing contribution of intern to development of resilience at pre and post moments; focus groups
14	Goralnik	2020	New Directions for Teaching and Learning	Empirical/Future sustainability problem solvers require contemplative practice so as to	Survey; mindfulness training

Table 1. Continued.

Journal no.	First Author Surname	Year	Journal	Article Format/Stand point	Methods
				navigate the social, environmental and economic dynamics of complex problems	
15	Hurley	2020	International Journal of Mental Health Nursing	Empirical/Nursing training does not adequately ready nurses with developing resilience and other non-technical skills.	Semi-structured interviews; questionnaire
16	Nicklin	2019	Applied Research in Quality of Life	Empirical/Study if psychological resources (mindfulness, self-compassion, resilience and recovery experience) help to minimise conflict and enhance enrichment for grads	Survey
17	Audley	2017	Journal of Environmental Studies and Sciences	Theoretical/Environmental resilience can prepare children to face wicked problems, such as climate change.	-
18	Reyes	2018	Journal of Psychiatric and Mental Health Nursing	Empirical/How can resilience training support war veterans transitioning back into civilian life via HE institutions?	Questionnaire; semi-structured interview
Search 3					
19	Andrahennadi	2019	International Journal of Art & Design Education	Empirical/How can mindfulness support clarity during design reflections?	Anecdotal insights
20	Azorin	2020	Journal of Professional Capital and Community	Conceptual/Can the Covid-19 pandemic be a supernova event for the complete reform of HE institutions in Spain?	–
21	Degbey	2020	Applied Psychology	Empirical/Resilience is something strengthened and developed through overcoming mundane events, not just large traumas or adversity for teams working in professional settings	Training interventions
22	Maree	2018	South African Journal of Psychology	Empirical/Life design counselling practices can support young woman transitioning to adolescence. How?	-
23	Shek	2017	Applied Research in Quality of Life	Empirical/It is the institutions problem to improve HE well-being in order to function as positive landmark in the transition of young people to adults, and to leaders.	Surveys
24	Takala	2019	International Journal of Sustainability in Higher Education	Empirical/Engineering challenges are changing – with sustainability becoming an important if not central imperative. The future engineers should be very different to the past engineers.	-
25	Therrien	2020	Journal of Contingencies and Crisis Management	Literature Review/There is a gap between resilience discourse and actual capacity to grow urban resilience in practice. This gap must be closed, as climate change brings about more urban disasters	Systematic literature review
26	Turner	2019	International Journal of Managing Projects in Business	Empirical/Establish a 'baseline profile' for construction grads that legitimises why resilience	Survey

Table 1. Continued.

Journal no.	First Author Surname	Year	Journal	Article Format/Stand point	Methods
				is needed and provides direction for development of a programme.	
27	Zandvliet	2019	Innovative Higher Education	Empirical/Designed learning environments support well-being in the classroom for students.	Survey

in reviewed literature, while resilience is conceptualised as a specific capability to be drawn upon when dealing with setbacks and negative events in the HE environment. The modelling of resilience in relation to wellbeing for HE students is most clearly offered by Turner, Scott-Young, and Holdsworth (2017). Turner et al. model resilience as antecedent to wellbeing. New stressful events encountered during HE studies provide moments where resilience can be called upon to boost student wellbeing. In this way, resilience is called upon to protect or insulate a student's ongoing wellbeing status from stressors, setbacks and other negative events.

Many approaches for developing resilience and supporting wellbeing are conceptualised across reviewed literature. Articles link resilience to emotional intelligence, with many articles featuring mindfulness training as an approach to build resilience (Akeman et al. 2020; Goodenough et al. 2020; Hurley et al. 2020). Several empirical articles investigate self-efficacy, self-esteem, confidence and motivation in relation to either wellbeing or resilience of HE students (Cassidy 2015; Robbins, Kaye, and Catling 2018; Turner, Scott-Young, and Holdsworth 2017). These studies demonstrate how psychology as a field offers those interested in supporting or studying student wellbeing and resilience a plethora of options, approaches and techniques to operationalise their goals. However, as Brewer and colleagues (2019) identify this has led to a conceptually diffuse literature landscape with many subsequent methodological approaches.

The described studies thus far do share proximity under the umbrella of cognitive psychology where cognition, behaviour and thoughts (CBT) provide building blocks of human experience. The interrelation of CBT is viewed as a developing process that can be adapted to improve how people experience everyday life, for example in treating depression and anxiety. CBT therapy is suited to supporting individuals who have little control over their environment such as HE students who are unable to remedy institutional challenges such as increasing degree fees, a culture that rewards performance, increasing class sizes and teacher shortages. These topical problems are highlighted in a number of articles reviewed in this study such as Duncan, Strevens, and Field (2020), Nicklin, Meachon, and McNall (2019) and Azorin (2020).

Duncan, Strevens, and Field (2020, 88) are most assertive in their critique of these factors describing the neoliberal turn of universities from public to private good, and the departure from egalitarian values of social liberalism. Azorin (2020) proposes that Covid-19 be the 'supernova' to which institutional change across Spanish education can be exacted.

Another theoretical viewpoint visible across the three searches was presence of positive psychology as a general movement underlying interest in individual wellbeing and fulfilment. In the 'second coming' of positive psychology, termed positive psychology 2.0 the importance of resilience becomes clear. Positive psychology 2.0 posits that negative events can be transformative sources of growth provided the individual has the right 'tools' (Hogan 2020). The importance of cognitive flexibility for reframing negative events and the ability to tell stories to peers provide two prominent 'tools' described by articles exploring the conceptual appropriateness of resilience in HE (Audley and Stein 2017; Maree, Pienaar, and Fletcher 2018; Nicklin, Meachon, and McNall 2019).

Of interest given the scope of designer resilience is how Turner, Scott-Young, and Holdsworth (2019), and Duncan, Strevens, and Field (2020) develop discipline specific profiles establishing

why resilience is required in their respective fields (construction management and law). Construction managers and lawyers will face careers characterised by stressful experiences that erode general wellbeing. Resilience becomes a capability to be drawn upon continually when faced with particularly stressful events, enabling an individual to remain effective as a practitioner.

These two discipline specific articles (Turner, Scott-Young, and Holdsworth 2019; Duncan, Strevens, and Field 2020) demonstrate how general resilience can be conceptually appropriated to meet the specific demands of a field of practice. Their approach relies on providing an account of why their respective disciplines necessitate resilience.

Operationalisation of resilience programmes in HE

Across all searches, it was clear that HE institutions are under pressure to integrate resilience programmes in order to:

- Prepare students for practice as the next generation of problem solvers and leaders;
- Respond to increasing mental health and wellbeing concerns for students in HE, and;
- Protect what is a marginal student-retention-reliant business model.

The operationalisation of resilience in HE occurs through extra-curricular programmes and curricular specific programmes. The two approaches offer limitations and benefits that are detailed in Table 2.

In three papers, (Goralnik and Marcus 2020; Goodenough et al. 2020; Hurley et al. 2020), resilience programmes are connected to specific curricula within HE. Hurley and colleagues (2020) connect the requirement for emotional intelligence (EQ) and resilience to specific experiences that nurses conducting practical placements encounter. EQ and resilience are non-technical work skills (NTWS) of nursing and are thus elevated into the curricula of Nursing education.

Goodenough and colleagues (2020) aim to increase the employability of their Bachelor of Science students by investigating the efficacy of internships. Based on their results, Goodenough and colleagues recommend that students take internships in order to develop flexibility and stress coping strategies that contribute to resilience and career readiness.

Goralnik and Marcus (2020) identify the need for resilience in courses of natural sciences, biology and geography where students converge under the collective challenge of 'sustainability'. Students in these courses will confront the wicked problem of climate change which encompasses value

Table 2. Benefits and limitations of general and curricular-specific HE resilience programmes.

Programme approach	Benefits	Limitations	Authorities
General Resilience Programmes	Large reach to many students Run by clinical psychologists An accessible support service to all students Allows teachers to focus on 'technical skills and knowledge'	Views resilience and wellbeing as 'extra' which conveys that studies are priority first, not health Not embedded within curriculum hence open to rapid institutional changes that come with new policy changes and funding allocation	Akeman et al. (2020); Nicklin et al. (2018); Reyes et al. (2018)
Curriculum Specific Resilience Programmes	Responds to praxis related challenges Embedded within curriculum thus protected from rapid institutional changes Advances research in the field Closes practice-education gaps	Facilitated by educators of that field, not clinical psychologists Must fit within existing curriculum Grading student resilience introduces a performance component which could undermine sharing setbacks	Goralnik and Marcus (2020); Goodenough et al. (2020); Hurley et al. (2020); Andrahennadi (2019); Turner et al. (2017, 2019)

conflicts, tensions, ethical and moral dilemmas and inequalities requiring emotional intelligence, patience and resilience. Goralnik and Marcus test the efficacy of mindfulness training through contemplative pedagogy, finding that meditation via '5 minutes of silence' to begin class calms students and clarifies immediate intellectual challenges. Whether this practice is sustained by students beyond the study is unknown.

Other papers located in HE (Akeman et al. 2020; Nicklin et al. 2019; Reyes et al. 2018) disconnect resilience interventions from discipline specific curricula, thus offering extra-curricular interventions as part of general student support. Reyes and colleagues follow 20 US military veterans transitioning back to civilian life and undertaking HE. These 'vets' require resilience to 'integrate' back into society while coping with mild to severe classifications of post-traumatic stress disorder (PTSD) developed as a result of their military service.

Empirical literature encountered across the three searches treads a fine line between investigating a psychological construct to advance science, while investing time to grow students as people. Brewer and colleagues (2019) also highlight methodological problems in the literature and these issues prevail during the updated search parameters of Search 2. For example, asking HE students to spend 1–2 hours completing a survey with little incentive is inconsiderate of their time. A large drop-out of participants mid-survey cannot be surprising to researchers. There is risk that journals that favour statistical reliability achieved from large participant samples may encourage research designs that treat students as numerical entities while not taking significant steps to benefit these same students.

Reyes et al. (2018) provide an exemplary methodology in this respect. They take time to qualitatively interview war 'vets' and follow their integration from service in HE. The process of interviewing these vets serves as a moment to build rapport and as the interviews were conducted by psychologists, even provide clinical care.

Another factor not always managed by reviewed studies relates to participant harm. Nicklin, Meachon, and McNall (2019) identify that conflict is required in order to promote resilience. Therefore, programmes that seek to develop resilience in HE students must tread a fine balance between evoking and reflecting upon bad experiences while providing safe learning environments. An important consideration raised by Audley and Stein (2017) is that protectionism of students does not foster resilience. Any programme or intervention for resilience must be mindful of the ethical dimension and involve psychologically trained experts in the planning and execution of such programmes.

Beyond Brewer and colleagues' (2019) conceptual and methodological critique of literature lies a deeper unaddressed institutional issue. Studies that treat students as recipients of resilience training fail to empower those same students to create and co-create with educators and administrators possible solutions to the problems facing them. While studies like Maree, Pienaar, and Fletcher (2018) encourage students to design the lives they want to live, approaches like these treat current institutional deficiencies such as increasing class sizes, increasing degree fees and an unchecked performance culture as norms that students must adapt to rather than challenge or even solve. Rather, resilience enables students to permit these norms, as described by Duncan, Strevens, and Field (2020) and Nicklin, Meachon, and McNall (2019) in particular. An opportunity to prepare independent, critical and enlightened new leaders who treat these conditions not as norms but as structures to be improved offer opportunities for new forms of HE.

This opportunity is highlighted by Kim and Fuessel (2020) when presenting their Changemakers Campus at Ashoka U. Kim and Fuessel reflect on integrating the Changemakers programme across 500 HE campuses. They present four principles that foster Changemaking graduates and community outcomes. Referring to principle four, 'systemic leadership', they state,

> Leaders need to embody these values and also action them across the organization as they seek to innovate systems for more equitable outcomes – whether across campus or society. That includes recognizing that leadership can be enacted by anyone and often emerges through interaction and experimentation (2).

Kim and Fuessel's article is short on explanation of how systemic leadership is taught and learnt, yet their notion of HE institutions being adapted by students as a co-creative approach with teachers and administrators has value.

Early notions of designer resilience

Maree, Pienaar, and Fletcher (2018) and Andrahennadi (2019) are the only articles that make explicit connection to design across the three searches. Andrahennadi (2019) being the only article that makes design discipline-specific placement of resilience and wellbeing in HE. While the article lacks data collection rigour regarding how this measurably benefits designers it does valuably reflect on how 'Eastern' traditions such as mindfulness are appropriated by 'Western' society under terms such as contemplative practice. During this appropriation, such practices lose their depth and authenticity as a total approach to life. Aside from developing calmness and clarity during reflection, it is unclear how Andrahennadi's programme connects to and supports other activities within design thinking such as analysis, synthesis and prototyping (Beckman and Barry 2007).

Maree, Pienaar, and Fletcher (2018) show how life-design counselling activities, for example 'drawing my own lifeline', 'talking about earliest memories' and 'drawing family constellations' are effective with young women. These activities concern reflection rather than initiating problem solving. The presence of visualisation and storytelling in these activities shares practical affinity to designing. While developed in secondary education and only with female participants, the activities described by Maree and colleagues do offer immediate transfer into the HE setting to shape learning activities.

Many articles reviewed provide an indirect contribution toward the emerging concept of designer resilience. Cassidy (2015) describes how fixed beliefs lower an individual's ability to remain resilient. Goralnik and Marcus, (2020) and Audley and Stein (2017) make important connections between the presence of wicked problems, particularly those of climate change, and the need for resilient problem solvers. Audley and Stein (2017) propose that reframing be 'the framework' that allows people to unlock growth from negative events. Reframing, storytelling and exploration are all hallmarks of design practice.

The limited range of articles with a direct connection to design presents a distinct gap in literature. This gap concerns how design students are prepared for the rigours of practice beyond a focus on methods and methodology. Two practice-based opportunities for future research are also identified:

(1) How are professional designers resilient to external stressors that impact their problem solving process such as managing budget and client expectations?
(2) How are professional designers resilient to stressors within the design process such as remedying fixation or navigating uncertainty?

Pursuing these research questions will clarify in what form resilience training should be integrated into design education in order to ensure meaningful relevancy to practice.

Regarding design education, initial linkages between resilience and design are presented in Table 3. These linkages offer opportunities to integrate resilience into design curricula to enrich learning experiences. The linkages are accessible to bachelor and master level studies. Academic counsellors can also benefit from these linkages by better serving design students who approach them for support.

Discussion

The sheer range of approaches and techniques adopted to develop resilience in HE has created a diffuse literature landscape confirmed by Brewer et al. (2019) where little conceptual clarity exists.

Table 3. Linkages between resilience and design.

Resilience	Link to design	Authorities
Narratives allow a storyteller to recount bad experiences to an audience. The audience assists the storyteller to 'reframe' bad experiences as new learning moment, thereby assigning new meaning	Narratives and storytelling are essential methods of design to explore past, present and future. Reframing also acts as an essential processual step within the co-evolution of problem and solution frames	Audley and Stein (2017); Maree, Pienaar, and Fletcher (2018); Hogan, (2020); Cassidy (2015)
Fixed beliefs lower resilience as individuals are set to preconceptions and bias	Fixation in design drastically lowers creativity and impedes the value creation process	Cassidy (2015)
Mindfulness and contemplative practice improves reflective thinking by creating moments of clarity	Reflective practice in design is part of the essential 'conversation' between designer that allows a solution to emerge as part of a co-evolution with the problem frame	Andrahennadi (2019); Goralnik and Marcus (2020)
Life design counselling assists young people to achieve self-efficacy by 'designing their own life'	In addition to creating technical solutions, design principles can also be applied to design ways to overcome setbacks	Maree, Pienaar, and Fletcher (2018)
Peer to peer networks are the infrastructure that allow communities in crisis to remain resilient	Designers are connected to their own supportive communities throughout their studies and careers. These communities can be more resilient, together	Hogan (2020)
Conflict is required in order to promote resilience	Designers face rejection and criticism. Hence perfectionism as an ideal should be approached with caution. Sharing moments of rejection and criticism can be learning moments to promote individual and community resilience.	Nicklin, Meachon, and McNall (2019)

However, two general approaches are identified in this literature review. First, articles that document resilience and wellbeing training to alleviate immediate health concerns of HE students in order to boost retention (Clafferty and Beggs 2021; Eisenberg, Lipson, and Posselt 2016) and enable students to better 'cope' with university (Akeman et al. 2019; Cassidy 2015; Robbins, Kaye, and Catling 2018). Second, articles specifying why resilience is required in HE in relation to specific professional challenges in the case of nursing (Hurley et al. 2020), the built environment (Turner, Scott-Young, and Holdsworth 2017), law (Duncan, Strevens, and Field 2020) and sustainability (Goralnik and Marcus 2020). These articles attempt to remedy described weaknesses in HE education through integration of resilience training into curricula.

While all HE-based articles point rhetorically toward general decline in the mental health of students, many articles do not confront institutional deficiencies that will further exacerbate the decline of students' health. In a small number of articles (Duncan, Strevens, and Field 2020; Nicklin, Meachon, and McNall 2019: Azorin 2020), issues like performance culture, insecure living situations, increasingly high degree fees, increasingly large class sizes and teacher shortages are raised. The Covid-19 pandemic has highlighted the intensity to which students experience these challenges (Lederer et al. 2021). While Duncan, Strevens, and Field (2020); Nicklin, Meachon, and McNall (2019); Azorin (2020) and Lederer et al. (2021) make recommendations for institutional reform to address these concerns, the majority of articles do not.

A lack of author agency to enact systemic reform may be reason for an absence of recommendations that confront institutional shortfalls across articles reviewed. Authors may also be pragmatic, doing what little they can with the limited resources available as they balance educational responsibilities with research commitments. As a result, HE students have been represented as conglomerate in their needs and passive in their role as students rather than empowered and possessing solutions to the problems proximate to them. Kim and Fuessel (2020) go furthest in arguing for empowered 'systemic leaders' yet details about the learning experiences that produce these qualities is limited in their article.

Discussion thus far has fuelled two critical questions not addressed in reviewed literature:

(1) What if resilience training allowed students to co-create with peers, educators and administrators the types of learning environments where they could explore their own evolving sense of identity and anticipate likely challenges in their prospective careers?
(2) What if resilience training was a way to reflect and sense make upon experiences of working and living within institutions under stress?

By treating current institutional challenges that effect HE student wellbeing as beyond the agency of teachers or students, an opportunity is lost to familiarise students with the rigours of enacting socio-technical change.

The integration of resilience training to support wellbeing presented across the literature either occurred within curricula or as extra-curricular. What is interesting is how discipline-specific resilience training responds to and advances the praxis-related problems of these fields (law, nursing, built environment and natural sciences). For example, the creative approaches to addressing practice-education gaps facing placement nurses in high stress environments (Hurley et al. 2020), or praxis challenges facing students attempting to reconcile how theoretical climate models are appropriated for political purposes in Goralnik and Marcus' sustainability classroom (2020). Such learning experiences require more than instruction from a textbook or lecture. These learning experiences push students to view the limitations of their chosen discipline and decide where outside help or research is required. These resilience programmes therefore have the possibility to enrich the quality of education provided while concurrently contributing to the development of fields through research that addresses lingering practice-education and praxis gaps.

Integrating resilience into design education

Through this systematic scoping review, a research gap pertaining to designer resilience is revealed. While there is literature that connects mindfulness to design (Andrahennadi 2019), this work is more a reaction to the need for calmness and clarity in a highly connected world, rather than acknowledgment of the internal cognitive and behavioural adversities faced within the design process. These adversities stem from the theoretical markers of design compounded by the ambition of designers to frame problems in systemic rather than reductive terms in order to create societal impact.

Future research must develop theoretical frameworks and experiment with new learning experiences for developing designer resilience. Initial starting points for prototyping should be:

- Developing activities and materials for evoking resilience in the designer by initiating learning through reframing of past setbacks and storytelling to peers;
- Developing activities and materials that first confront the designer with a novel setback as a new cognitive demand, then stimulating cognitive flexibility through role playing;
- Developing activities and materials that ask the designer to imagine and anticipate setbacks encountered in a career of addressing wicked problems such as climate change to engage foresight;
- Developing co-creation activities and working groups between HE students, educators and administrators in order to challenge underlying topics such as the effect of increasing class sizes, increasing degree fees and heightening performance culture.

Dissemination of future research will contribute to a vibrant and valuable literature landscape that offers tangible opportunities for HE educators, HE administrators and HE students.

Conclusion

The sheer range of approaches and techniques adopted to develop resilience in HE has created a diffuse literature landscape. Findings from the scoping review show that two approaches emerge in this landscape. First, articles that react to a decline in student mental health and attempt to remedy this through general resilience or wellbeing programmes. Second, articles that establish how the future demands of graduates will require resilience that is embedded deep within disciplinary practice. Reviewed articles in the fields of nursing, law, built environment and sustainability demonstrate conceptually how resilience can be incorporated into the classroom.

Many practical and conceptual synergies between resilience and design that provide pathways for developing educational innovation. The presence of cognitive flexibility, storytelling, reframing and reflection lie at the core of the practice of resilience and design. Shared synergies provide opportunities to create principles and frame learning experiences that can be implemented in the design studio or classroom to develop designer-specific resilience. Further applied research is required to action this ambition.

In summary, the article makes the following three major contributions to the extant literature:

(1) Identifies that the HE sector is addressing student resilience and wellbeing concerns via general and discipline-based approaches;
(2) Establishes benefits and limitations of existing general and curricula specific resilience and wellbeing programmes to improve wellbeing, and;
(3) Develops the foundations for the emerging concept of designer resilience.

These contributions are valuable and relevant to HE educators, HE policy makers, HE students and HE student support services as they reveal developments regarding how student wellbeing is addressed through curricular-specific and general resilience programmes. Importantly, this article establishes the concurrent education and research benefits of integrating resilience into HE curricula. The third contribution is particularly valuable to design schools, staff and students invested in addressing emergent and detrimental education-practice gaps that plague the discipline (Meyer and Norman 2020).

The implications of this article are that resilience as a diffuse construct can be brought into design education using the identified linkages in Table 3 as a starting point for development. Further, the prototyping activities outlined in the discussion serve as inspiration for developing designer resilience. While this article has scoped to design education, fields connected by design science such as engineering or architecture can benefit from the disciplinary proximity of this article. More general notions of resilience for creative problem solvers remains an avenue for future research with strong generalizable potential to a wide range of disciplines taught in HE.

Note

1. When conducting a 'Hail Mary' search into a university database for: 'Designer Resilience', no results appeared. When changing tact, and searching for 'design resilience', 187 results were returned. However, these articles strongly aligned to a technical construct of resilience nested in engineering, ecology and biology.

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Appendix: Scoping review articles

Search 1:

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