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# Supporting health literacy in adolescent populations: distinguishing pedagogies for sun safety education in schools

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**Purpose** – The aim of this paper is to distinguish pedagogies supporting critical health literacy development in adolescent populations. Specifically, for sun safety education in schools.

**Design/methodology/approach** – The paper draws on an exploratory intrinsic case study design to qualitatively examine the learning conditions that Pre-Service Teachers' (PsTs) mobilise to advance Health Literacy (HL) in learning activities.

**Findings** – ~~Health Literacy (HL) is a relatively new concept to adolescent healthcare, but increasingly prominent in health promotion and health education.~~

~~Three levels of HL; functional, interactive and critical, progress agentie behaviour toward sustainable health outcomes for own and others' health. In schools and school-based resources, the mobilisation of HL is relatively novel.~~

This paper presents data that shows the different ways thirty Pre-Service Teachers (PsTs) in Western Australia conceptualise HL in sun safety education for Year 7 students (12-13 years old). Examination of three consecutive lesson plans categorised learning activities (n=444) according to HL competencies. Data shows that the PsTs pedagogically advance HL but are constrained when conceptualising learning to support critical HL. Further examination of the lesson plans of the 11 PsTs who pedagogically advanced learning to support a critical level of health literacy distinguished the learning conditions and pedagogies supporting critically health literate adolescents.

**Originality** – By distinguishing pedagogies to situate individual and social health within broader societal goals, the paper identifies teacher education institutions as key players enabling young people to socially advocate healthier living, particularly, regarding melanoma and non-melanoma incidence.

Keywords: adolescent health; Schools; Skin cancer; Teacher education

## **Introduction**

Health literacy (HL) is recognised as an empowerment strategy targeting agentic health behaviour, health inequity and sustainable health outcomes (World Health Organization [WHO], 2020c). It refers to an individual's ability to access, understand and use health information to action personal, community and population health goals. Established by Don Nutbeam in the late 1990s and formally defined in 2000, HL is conceptualised as a three-tier hierarchy of competencies (functional, interactive and critical HL) to support, measure and assess cognitive and social ability to impact upon own and other's health (Nutbeam, 2000; 2008). A body of research links low HL to low health outcomes and relative to social gradient (Aghazadeh *et al.*, 2020; Kickbush, 2001; Paakkari *et al.*, 2015; Park *et al.*, 2017; Sørensen *et al.*, 2015).

Paakkari and Paakkari (2012) describe an individual who is health literate as having theoretical and practical knowledge, critical thinking skills, self-awareness and a sense of citizenship to ethically reflect and advocate, for and about health, in oneself, others and the world beyond. The global response to the Coronavirus (COVID-19) pandemic – stay home, wash hands frequently, cough into elbows and adhere to social distancing – typifies functional HL and cognitive and literacy skills (WHO, 2020a). Downloading and interacting with contact tracing Apps such as those available in Australia and England characterise interactive HL and more advanced cognitive and literacy skills (Australian Government, 2020; National Health Services, 2020). Diarising, critiquing and planning to respond to limitations in personal movement, whilst facilitating essential services to support own and others' health can be linked to being critically health literate and where health-related information is analysed, and actions applied.

Paakkari and Paakkari (2012) characterise HL development as an on-going and life-long process, requiring both opportunity and specific learning to progress

individuals to think beyond personal interests and apply social responsibility (Peralta *et al.*, 2021). They identify five learning conditions as progressing young people through Nutbeam's competencies (2008). Paakkari and Paakkari's conditions exemplify the types of learning that teachers can actively plan and work with to advance young people to critical HL skills. The five conditions are:

- 1) theoretical knowledge such as the learning of facts, concepts, principles, guidelines, and rules pertaining to health matters;
- 2) practical knowledge such as ways to apply, respond, follow and act in given health situations;
- 3) critical thinking skills to actively question, contemplate, rebut and/or refute, and value health information;
- 4) self-awareness to support a sense of belonging, purpose, and perspective, leading to positioning, priorities and actions relating to health; and
- 5) citizenship such as ethical understandings, rights, and responsibilities for advocating health and ways of participation that move beyond the self to support community and societal health goals.

In Australia, HL is one of five key ideas informing the Health and Physical Education<sup>1</sup> (HPE) curriculum in Australian schools (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2012, 2013, 2015). Collectively, these key ideas provide an interactive framework to guide Australian teachers in their pedagogical

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<sup>1</sup> This learning area differs slightly to conceptualisations of Physical Education (PE) in countries like England as it includes learning to support personal, social and community health, which is like the learning in Health Education in Finland (Paakkari *et al.*, 2015).

practice to enact safer, healthier, and more physically active living. They support 21st century learning by focusing on (1) educative purpose, (2) a strength-based approach, (3) the valuing of movement, (4) HL skills and (5) critical inquiry (Alfrey & Brown, 2013). Specific inclusion of HL within the Australian Curriculum for HPE acknowledges the significance of childhood and adolescence as the precursor to health and wellbeing in adulthood, and the WHO's recommendation for school-based curriculum to mobilise HL in learning (WHO,2014).

Aligning with the assets-focus of the Australian Curriculum for HPE (ACARA, 2015), Paakkari and Paakkari's learning conditions progress in complexity, facilitating students who know, do, question, locate and advocate (2012). They perceive critically health literate adolescents as a resource; a purposeful learning outcome actioned through the promotion of the mutually supportive learning conditions. This paper presents findings from a study that examined the ability of Pre-Service Teachers (PsTs) (n = 30) at an Initial Teacher Education Institution (ITEI) in Western Australia (WA) to mobilise HL across three consecutive lesson plans (n = 90). Using Nutbeam's (2000, 2008) hierarchy to initially distinguish the complexity and competency of learning activities (n = 444), the study critically examined PsTs conceptualisations of HL in learning. Data shows that whilst the PsTs could advance functional and interactive HL, they were constrained in their ability to develop learning for adolescents to reach a critical level of HL (Barwood *et al.*, 2020).

By focusing specifically on the lesson plans of the PsTs (n=11) who had progressed critical HL in learning, the study sought to examine and affirm Paakkari and Paakkari's (2012) learning conditions as a valuable tool assisting ITEIs to prepare PsTs with pedagogical opportunity to develop critical HL in health learning. Data shows that

critical HL development was mobilised when the PsTs met the learning conditions described by Paakkari and Paakkari.

As the study is based in WA, an Australian state with high incidences of melanoma and non-melanoma (Barwood *et al.*, 2017, Cancer Council of Western Australia [CCWA], 2014), content of the PsTs lessons focused on sun safety education for adolescents. Therefore, the study also aimed to distinguish pedagogies supporting critical HL particular to safe(r) sun behaviour. The paper presents insights which are relevant to countries similarly impacted by high incidences of melanoma and non-melanoma like Norway, because educational resources for sun safety in Australia were found to privilege functional and interactive HL competencies (Barwood *et al.*, 2020). This is despite the significant focus of sun safety in the teaching and learning of health education and more broadly, within Australian schools. The paper will be of value to those seeking to address health inequities through school-based learning because pedagogies situated within broader societal and cultural health goals are recommended to empower young people to take an active role in socially advocating healthier living. As young people require learning to support such actions, the author believes that ITEIs play a vital role creating learning conditions and/or pedagogies to promote HL development and cultivate critically health literate populations. By preparing PsTs with skills and understandings to be informed HL pedagogues and critical consumers of educational resources, ITEIs can further the conceptualisation of HL in schools and other contexts.

### **Melanoma, non-melanoma and ultraviolet radiation**

Melanoma and non-melanoma of the skin are health concerns significantly contributing to lives lost and the economic burden of disease in global populations. Melanoma is more serious and life threatening than non-melanoma, with approximately 300,000

global cases reported in 2018 (Globocan, 2020). Non-melanoma is less dangerous but records higher incidences; more than 1,000, 000 in 2018 (Globocan, 2020), and is more costly. For instance, two in three Australians will develop non-melanoma before the age of 70 (CCWA, 2014), at a cost to the Australian economy in excess of \$650 million per annum (Barwood and Jones, 2019). Melanoma and non-melanoma are collectively referred to as skin cancer and linked to high ambient ultraviolet radiation (UVR).

From a geographical perspective and in the absence of all other factors, countries that have the highest ambient UVR would be expected to show the highest incidences of skin cancer amongst populations (Williams and Dienes, 2014). However, this is not the case. The top ten countries highly impacted by skin cancer include Australia, New Zealand, Norway, Denmark, the Netherlands, Sweden, Germany, Switzerland, Belgium and Slovenia (World Cancer Research Fund, 2020). Countries that have the highest ambient UVR such as those around the equator are typically populated with people who have a greater concentration of melanin in their skin, which contributes to a darker skin tone (Narayanan *et al.*, 2010). In these populations, the high concentration of melanin is an adaptation to the environment which acts as a natural protective factor dissipating UVR. Predictably, global data shows that some of the highest rates of skin cancer are amongst populations with fair-skin and less melanin (Australian Bureau of Statistics, 2016; Carter and Donovan, 2007; Globocan, 2020; Gordon and Rowell, 2015; Perera *et al.*, 2015). The high incidence of skin cancer occurs despite countries in which these populations reside having some of the lowest global recordings of ambient UVR such as in Scandinavian countries (WHO, 2020b; WHO, 2020d).

Australian skin cancer statistics, although high, are improving, validating the significance of ongoing public awareness such as the radio announcements of the daily

UV Index<sup>2</sup> and mitigation strategies regarding sun exposure such as education (CCWA, 2019; Cancer Council of Australia [CCA], 2020). The relative success is despite Australia having approximately double or more ambient UVR than countries with a similarly high incidence rate (WHO, 2020b). For instance, research indicates that the Norwegian population have poor awareness and are delayed in responding to melanoma, leaving diagnosis to an advanced stage (Robsahm *et al.*, 2018). This results in higher mortality rates in the Norwegian population, which in turn questions their ability to make proper decisions regarding sun care and when accessing health care services. Equally, research found that high sales of sunscreen in high income countries in Northern Europe did not appropriately correlate to incidence reduction, suggesting that sunscreen use in these countries provided a “false sense of protection” against melanoma (Williams and Dienes, 2014, p. 4).

Whilst skin cancer can be linked to occupation, the common and compounding factor irrespective of country is over exposure to UVR (Dobbinson *et al.*, 2009; Sandhu *et al.*, 2016; Williams *et al.*, 2011), with functional HL actions like covering up and limiting the time spent in the sun, especially at peak UVR times, significantly reducing harm (Slevin, 2014). This is particularly pertinent during childhood and adolescence where overexposure during this timeframe is associated with increased risk of skin cancer development in later life.

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<sup>2</sup> A globally agreed scale to describe UVR and used as a protective tool to report the amount of sun exposure. In Australia the recommended level of three is exceeded on most days.

## **Conceptualising health literacy in schools: programs, resources, curriculum, and initial teacher education**

The inclusion of HL as a key idea in the development of the Australian Curriculum for HPE (ACARA, 2012; 2013) reflected growing awareness of the potential of personal and social advocacy to shape and support health outcomes. It recognised the significance of knowledge, skills, values and attitudes like critical analysis, decision making, advocacy and empowerment as capacity building influencers, enabling young people to take greater control of their health destiny (Alfrey and Brown, 2013; Barwood *et al.*, 2020; Nutbeam, 2000; Paakkari and Paakkari, 2012). Peralta *et al.* (2017) report that Australia, like Canada, are more forward-thinking countries progressing the discourse of HL in schools.

Despite the growing interest and realisation that young people make decisions about their health and wellbeing on a daily basis, research indicates that conceptualisations of HL within school programs, educational resources and curriculum remain underdeveloped (Kilgour *et al.*, 2015; McCuaig *et al.*, 2012; Peralta *et al.*, 2017). By way of contrast, a growing body of research outlines the competency of adolescents to be health literate and the ways in which a whole school approach to HL supports health outcomes (Peralta *et al.*, 2021). For example, research in the United States of America (USA) linked the absence of community supports to low levels of HL in adolescents, attributing the inadequacy of HL in parents and/or carers as a causative factor (Brown *et al.*, 2007). Paakkari *et al.* (2020) from a European perspective, found that the level of adolescent HL was critical when developing health interventions, advocating for programs to be specifically tailored to meet the level of HL in this age group. Park *et al.* (2017) connected poor adolescent HL to unfavourable health outcomes such as unhealthy weight and obesity. Finally, Taiwanese researchers (Shih *et*

*al.*, 2016) strongly recommended the inclusion of HL curriculum in schools to mitigate childhood obesity, finding these competencies effective in reducing childhood obesity.

Notwithstanding the contextual differences and difficulties developing HL within and through schools, the call for HL as an early intervention strategy supporting adolescent health and healthier adulthood is consistent across research. As outlined by Aghazadeh *et al.* (2020), this is because schools, at the core, represent opportunities for students to learn and practice HL competencies before and whilst health behaviour is developing.

In Australia, the Australian Professional Standards for Teachers<sup>3</sup> (Australian Institute for Teaching and School Leadership [AITSL], 2011) govern what Australian teachers are expected to demonstrate across three domains: Professional Knowledge, Professional Practice and Professional Engagement. Within these domains it is both overt and implicit that Australian teachers are expected to understand, apply, and progress curriculum, pedagogy and concepts pertaining to learning areas such as HPE. In addition, the guiding principles of the standards are mapped to four career stages: Graduate, Proficient, Highly Accomplished and Lead Teacher. To achieve registration as a Graduate Teacher in Australia, a PsT must evidence the meeting of all standards. As HL is a key idea underpinning pedagogy in HPE, ITEIs that prepare HPE teachers in Australia are therefore expected to prepare PsTs to integrate HL into their teaching and learning. The need to integrate HL as specific pedagogical and content knowledge has been reported by numerous researchers (Alfrey & Brown, 2013; Barwood and Jones,

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<sup>3</sup> See <https://www.aitsl.edu.au/teach/standards/understand-the-teacher-standards> for further information on the

Australian Professional Standards for Teachers.

2019; Barwood *et al.*, 2020; McCuaig *et al.*, 2012; McCuaig *et al.*, 2014; Peralta *et al.*, 2017; Peralta *et al.*, 2021).

### **Young people and their health**

Adolescents access health information from many sources and are increasingly bombarded daily with complex, confusing and sometimes contradictory health messages. As such, they require knowledge, skills and a disposition to critically navigate their way as global citizens (ACARA, 2015; Paakkari and Paakkari, 2012). At the same time, they experience significant physical and social change impacting upon their ability to problem solve and make decisions (Peralta *et al.*, 2017). For example, in the context of this study and regardless of a high level of knowledge, adolescents have been found to poorly adhere to safe sun practices, at times favouring the look of tanned skin (Eastabrook *et al.*, 2018; Rainous *et al.*, 2018). More particularly and in Australia, adolescents are more prone to significant and repeat sunburn, with incidences of melanoma in this age group on the rise (Barwood *et al.*, 2017; CCWA, 2018; 2019).

In acknowledging the very nature of a captive audience, schools play a significant role improving adolescent health (Paakkari *et al.*, 2015; St Leger, 2001; WHO, 1999). For example, they can provide educative opportunities to support safer sun behaviour. Schools also represent capacity to build HL and in using Nutbeam's (2000) middle level of HL (interactive) as just one example, can provide opportunities for adolescents to interpret, interact and apply knowledge of UVR to attain and remain safe when in the sun. This paper now turns to the study and the focus on initial teacher education as a capacity building institution supporting adolescent HL.

## **Methods**

To distinguish pedagogies to support adolescents to enact critical HL when in the sun and other activities, an exploratory intrinsic case study design (Yin, 2018) investigated the ability of PsTs at an Australian ITEI to conceptualise HL in sun safety education. The case study design was chosen to specifically investigate the unique context of PsTs' pedagogical decision making for learning to support Year 7 students (12-13 years old) (Yin, 2018).

Recognising the potential of the PsTs as future educators supporting and strengthening safer and healthier living in WA, the study sought to examine the capacity of ITEIs to support HL development in school learning. Using Paakkari and Paakkari's learning conditions as insight, the following research question formed the basis of this paper:

1. How do PsTs pedagogically advance HL competencies in sun safety education?

## ***Participants***

The PsTs (n=30) were enrolled in a Post-Graduate teaching degree at an ITEI in WA and on graduation would qualify to teach HPE in Australian secondary schools. The majority of the PsTs identified as female (63%) and the remainder as male (37%). The PsTs ranged in age from early 20s to late 40s, recording an average age of 29 years across the group.

## ***Data and Data analysis***

Data were collected via three lesson plans from each PsT (n=30). In the first phase of data analysis, the PsTs' lesson plans (n=90) were analysed using Nutbeam's hierarchy of HL competencies (2000) to qualify the complexity of the lessons' learning activities (n=444). Using an iterative approach, a research team consisting of three researchers

worked independently at first, drawing on and postulating the complexity of each learning activity according to Nutbeam. They then worked collaboratively to attribute an agreed level of complexity and in the third round, confirmed the HL complexity of the learning activities. In total the 444 learning activities were analysed three times (n=1332). Following this, the complexity of the learning activity was quantified per HL competency (functional, interactive and critical) and per the lesson plan, to evidence where and the extent to which the PsTs were conceptualising critical HL.

Data analysis in the next phase involved the author independently returning to the PsTs' lesson plans and qualitatively exploring their conceptualisations of sun safety education to distinguish pedagogies with potential to target critical HL. The author drew from Paakkari and Paakkari's (2012) extension of Nutbeam's hierarchy (2000), which described the learning conditions supporting HL development in students in schools. The author examined the data set and specifically, the PsTs' lesson plans progressing to a competency of critical HL (n=11). She qualitatively explored these PsTs' conceptualisations to identify examples of Paakkari and Paakkari's learning conditions (2012). In doing so, the 33 lessons were similarly reviewed three times (n=99) as per the first phase. That is, to firstly match a learning condition to a learning activity, secondly to affirm the match and thirdly, to confirm the match.

Creswell (2014: 64) characterises qualitative researchers as applying theoretical lenses to support a "call for change". The researcher applied Nutbeam's (2000) hierarchy to assess the HL complexity of learning activities and Paakkari and Paakkari's (2012) learning conditions to develop pedagogical insight to further HL discourse in schools and at ITEIs. The author positions the use of Paakkari and Paakkari's (2012) learning conditions as a form of organisational theory to progress the research.

### **Finding 1: qualifying and quantifying health literacy conceptualisations in PsTs' sun safety education**

The PsTs (n=30) created three consecutive lesson plans (n=90) containing 444 learning activities. Across these lessons, 155 learning activities were found in lesson one (35%), 150 in lesson two (34%) and 139 in lesson three (31%). Given all things equal, one would expect to find an even amount of activities per HL competency across the three lessons. That is, 148 learning activities per HL competency (functional, interactive and critical). However, this was not the case. The data shows that 62% of the learning activities were positioned as functional HL, 33% were interactive HL and 3% were critical HL.

Although the HL competency of the learning activities were not evenly distributed across the three lessons, the distribution was not unexpected. The distribution corresponded with the PsTs' pedagogically advancing health concepts, understandings of sun safety and HL across the three lessons. For example, lesson one could provide students with simple, foundational knowledge to support understandings of the UVR (functional HL). Lesson two could progress the students' actions to 'be' and 'remain' safe when in the sun (interactive HL). Lesson three could progress and apply more complex sun safety concepts such as exploring ways to make change in the local community (critical HL).

At this time, it is important to be reminded that 63% of the PsTs were unable to develop learning to support critical HL. Of those who conceptualised critical HL (n=11), only two conceptualised this competency in the first lesson, with one PsT (of the two) repeating the competency in the final lesson. Two different PsTs' conceptualised critical HL in the second lesson with only one of these repeating the competency in the final lesson. Of the 11 PsTs, 10 conceptualised critical HL learning

within the third lesson but only five provided more than one opportunity to develop critical HL.

**Finding 2: the learning conditions supporting health literacy conceptualisations**

Qualitative data presented here shows the ways that 11 PsTs targeted critical HL. It describes the types of pedagogical activity that Paakkari and Paakkari refer to as learning conditions (2012).

*Conditions to promote the learning of theoretical knowledge*

Paakkari and Paakkari (2012) define theoretical knowledge as foundational knowledge, typifying the lowest levels of Bloom's taxonomy of cognitive skills (1956)<sup>4</sup> and that is, to remember and understand facts. In facilitating this learning condition, teacher's act as the expert and students are passive recipients of information. For example, by providing opportunities to build theoretical knowledge the PsTs expected their students to be able to remember and recall sun safety facts. In doing so, the PsTs utilised teacher-directed learning activities such as teacher talk, PowerPoint presentations, class discussions, brainstorming, the viewing of digital media and web-based learning. The foci of these learning activities included: UVR and the UV Index; temperature and relationship to UVR; sun safety measures to prevent and reduce harm when in the sun (slip slop, slap, seek and slide); harm from UVR and the effect on the body; Sun Protection Factor (SPF) labels on sunscreen products; skin type and risk; skin cancer statistics; skin

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<sup>4</sup> Bloom's taxonomy is in some way like Nutbeam's HL competencies, as a hierarchy of learning objectives increasing in complexity to frame and analyse learning outcomes. The taxonomy progresses the following cognitive capacities: remember, understand, apply, analyse, evaluate and create.

cancer treatment; and discussions around what skin cancer looks like. Overall, this learning aimed to increase student factual knowledge of the sun and UVR and prepare them for more interactive and student-centred learning in other activities.

### ***Conditions to promote the learning of practical knowledge***

Paakkari and Paakkari (2012) describe the next learning condition as progressing theoretical knowledge into a practical context but without challenging students to be critical or reflective thinkers. For this condition the teacher remains the expert but emerges as more of an organiser than a director, using learning activities to activate the students. The skills-based activity of practicing the correct method to apply and reapply sunscreen is an appropriate example.

The PsTs met this learning condition through a range of pedagogical activities and the foci of these included: selecting attire to be sun safe; using the SunSmart App to calculate a safe amount of time to spend in the sun; finding the UV rating through the UV Index for the day (local); global mapping of the UVR and UV Index through an Internet search; using skin surveillance techniques and the skin App to identify different types of skin moles; categorising skin moles; planning and packing a kit for the school sport day; and choosing sunscreen for different activities. Although some of the PsTs' activities for this learning condition could be considered as progressing the students more toward Bloom's classification of analysing, the students were not required to critically think nor position themselves. Instead, they were required to apply knowledge previously learnt in activities that were skills-based in nature.

### ***Conditions to promote the learning of critical thinking***

Paakkari and Paakkari (2012) differentiate this learning condition from the previous, describing it as a combination of knowledge and context that is both problematic and

diversified. Learning in this condition requires students to question, contemplate and consider from multiple perspectives rather than just receiving and doing as per the first and second learning conditions. At this point, the teacher is a facilitator, supporting critical thinking but also encouraging the students to find their way and position.

The types of learning activities utilised by the PsTs involved Bloom's (1956) categories of analysing and evaluating such as problem and decision-based scenarios. Examples of the foci for the PsTs activities meeting this learning condition included: world travel planning; what is needed where, when and why; assessing risk in different contexts and choosing the safest option; rating sun safe strategies and evaluating UVR protection; mapping daily UVR to predict the UV Index; choosing props to respond to a range of scenarios and justifying selections; identity quests; contemplating who is at risk and why; brainstorming where and when sun protection is not required; making a UVR detector with UVR sensitive beads; examining why people repeatedly sun burnt their skin; and evaluating local UV Index reports and selecting the one most useful to them. For this learning condition, Paakkari and Paakkari (2012) advise teachers to employ participatory pedagogies where students, with the support of the teacher, explore differing perspectives.

### ***Conditions to promote the learning of self-awareness***

For this learning condition, students situate knowledge and skills with life experience(s), to strengthen positioning, promote critical reflection and build courage. To do so, students make sense of themselves from the health knowledge learnt, to find a sense-of-belonging and autonomy. Paakkari and Paakkari (2012, p.143) state that learning in this space is "highly personal and relational", where opinions may differ, and process is critical. This type of learning can be located within Bloom's (1956) cognitive category of evaluating.

Using a range of activities to facilitate this learning condition such as journaling, personal statements and reflections, the PsTs moved from facilitatory activity to mentor, coach and trusted advisor. Examples of foci meeting this learning condition included: predicting future photo imaging from sun behaviour; diarising activities that are safe and unsafe; connecting values to actions; journaling ways to remain sun safe with differing people and in different contexts; developing refusal strategies to counteract peer pressure; reflecting on the last time their skin was sun burnt - what did it feel like, why did it happen and where; postulating the conditions where prevention and protection are more and less likely; identifying body parts that are neglected and developing ways to disrupt/interrupt this neglect; developing personal checklists to keep safe in the sun; justification statements as to why being sun safe is important to 'me'; and critical reflections around how sun smart one is and can be.

### ***Conditions to promote the learning of citizenship***

In meeting this learning condition, the PsTs utilised individual and group work, progressing peer collaborations to move student understandings from a sense of 'Me' to 'We' to 'Us'. To achieve the complexity of this type of learning, the PsTs challenged the students to become creators, designers and architects 'of' and 'for' health change (Bloom, 1956). Speaking metaphorically, the PsTs were no longer holding the hands of their students but empowering them to be agentic and enabling citizens who can advocate health on a range of levels. For example, advocating a peer or family member to reapply sunscreen as opposed to advocating change in the local community which can enhance sun safety awareness. Activities with this foci in the PsTs' lesson plans included: developing recommendations to explain the UV Index to someone who could not use it; constructing recommendations for travellers to Australia and advising how these individuals could assess risk whilst holidaying; creating a sun safe policy for the

school and/or community; designing SunSmart school uniforms; assessing sun risk in the workplace and for different occupations; developing recommendations to enhance occupational sun safety; conducting an analysis of a part of the school and redesigning the area to improve sun safety; creating a community UV awareness campaign; plotting the positioning of sunscreen stations around the school and justifying the position; planning sporting events to be sun safe like the school's factional carnival; creating sun safe daily messages for school bulletins; and developing narrative to convince someone to take sun safe action and access health services. Paakkari and Paakkari (2012, p. 146) capture the sensitivity, empathy and mutually supportive condition of this type of learning, by describing the teacher's expanding role as covering "aspects of being a fellow learner" whilst the student's role expanded "to cover aspects of being a responsible member" of a community.

### **Discussion: distinguishing pedagogies for sun safety education in schools**

The purpose of the paper was to contribute insight to the scholarship of health pedagogies supporting and strengthening adolescent health. The findings of the study qualified and quantified that the majority (63%) of the PsTs were unable to mobilise critical HL in lesson planning, and those that progressed learning to develop critical HL, actioned five learning conditions (Paakkari and Paakkari, 2012). These findings point to the rich potential for ITEIs, irrespective of country and context, to appropriately prepare PsTs with the tools to conceptualise functional, interactive and critical HL in learning. In Australia, the findings are supported by policy governing the professional knowledge, practice and engagement of Graduate Teachers (AITSL, 2011). As research also points to the shortcomings of HL in populations, leading to poor health outcomes and health inequity (Aghazadeh *et al.*, 2020; Kickbush, 2001; Paakkari *et al.*, 2015; Park *et al.*, 2017), the study affirms the significance of ITEIs as critical players in

enabling HL within adolescent populations. Moreover, and in agreeing with the recent work of Aghazadeh *et al.* (2020), the study points to ITEIs as supporting a population that has largely been overlooked.

The PsTs in this study mobilised a range of pedagogies, which Paakkari and Paakkari (2012) refer to as conditions to promote learning. The first two conditions, learning that promotes theoretical knowledge and practical knowledge, were clearly established by the PsTs. This success can partly be explained by the provision of an intensive UVR training workshop by the CCWA. The third condition, to promote critical thinking, was also established across the lessons and this condition is particularly critical to the context of sun safety education because previous research found that adolescents have high knowledge but are prone to making poor decisions when in the sun (Barwood *et al.*, 2017; Williams *et al.*, 2011). By providing learning that encouraged students to question knowledge amidst personal and societal beliefs, and values and behaviour such as the incidence of repeat sunburn in adolescents, the PsTs were supporting transformational thinking, which in turn could broaden student capacity to enhance health.

Paakkari and Paakkari's (2012) fourth condition to develop HL was a strength of the PsTs and can perhaps be attributed to the ITEI's strong pedagogical focus on meaning-making in health and in promoting a sense of self, sense of others and a sense of belonging through learning activity. As this learning condition was both clearly and repeatedly evident across the PsTs' lesson plans, despite positioning toward the top of Bloom's taxonomy (1956) of cognitive activity, it emphasises the positive pedagogical alignment between the work of Paakkari and Paakkari and the ITEI. Such a view is also in alignment with the pedagogical tenets of the Australian Curriculum for HPE (ACARA, 2015) and, in some ways, to the goals but not necessarily the outcomes of

curricula in other countries like Finland and the USA (Aghazadeh *et al.*, 2020; Brown *et al.*, 2007; Paakkari *et al.*, 2015).

Although the PsTs advanced learning to encompass a range of social advocacy activity, this learning did not appropriately build cultural and ethnic capital as per Paakkari and Paakkari's (2012) condition. It did explore local, community and societal contexts, promoting ethical responsibility and a sense of citizenship on different levels such as with peers and the world beyond. However, greater awareness and emphasis of culture and ethnicity in relation to health and health practices were needed. This was particularly pertinent to sun safety as persons with darker skin may not necessarily employ the same protection strategies as persons with fair skin (Narayanan *et al.*, 2010). In addition, different groups within society may require different types of support to access health care services.

Thus, in complying with the policy framework of the Australian Professional Standards for Teachers (AITSL, 2011) and in recognising the limitation and/or weakness of the PsTs at her ITEI, the author of this paper recommends other ITEIs' place greater emphasis on building cultural and ethnic capacity when preparing PsTs to create learning to support HL. This does not mean that the PsTs in the study were culturally/ethnically unaware or insensitive, it means that these PsTs were not appropriately accommodating the diversity of culture and ethnicity in their learning activities. Therefore, and to support this capacity in future PsTs at her ITEI, the author has redeveloped Paakkari and Paakkari's learning conditions to the moniker of the *Health Literacy Enabling Framework for School Curriculum* (see Table 1). This framework has not progressed Paakkari and Paakkari's work but serves to simplify it especially for use with the author's PsTs.

<b>Pedagogy</b>	<b>Teacher Activity</b>	<b>Teaching Method and Learning Activity</b>
<b>To Know</b>	Teacher is the expert sharing factual (theoretical) knowledge	Teacher directed learning with students who are passive recipients of facts and knowledge such as through teacher talk, brainstorms, class discussions, digital media, PowerPoint presentations and web quests.
<b>To Do</b>	Teacher is the organiser, guiding the application of knowledge in practice	Teacher and student collaborative learning, where students apply factual knowledge in practice through participatory and skills-based activity such as hands on practices, trial runs, puzzles, and role plays.
<b>To Question</b>	Teacher is the facilitator, encouraging critical thinking and questioning	Teacher facilitates individual and group-based learning, where students participate in activities that require them to question, problem solve and make decisions such as through scenarios, concept mapping, predictions, debates, justifications, and data analysis.
<b>To Locate</b>	Teacher is the trusted advisor, advancing self-awareness	Teacher promotes meaning making in relation to health of oneself and others by creating learning that contemplates the 'Why' factors. Activities build a sense-of-self and sense-of-belonging such as through critical reflections, journaling, future planning, and position statements.
<b>To Advocate</b>	Teacher is the enabler, building sense of citizenship through individual, social and cultural capital	Teacher mentors' students to progress micro and macro health such as refusal statements, narrative to support peer change, designing local health messages, strategic planning, recommendations for the accessing of health care services and the creation of public awareness campaigns. Students explore advocacy of safer, healthier, and more physical active living for themselves, peers, family, community, cultural and ethnic groups, and society and the world beyond.

**Table 1.** Health Literacy Enabling Framework for School Curriculum

**Source(s):** Adapted from Paakkari and Paakkari (2012)

## **Concluding comments**

In mobilising a framework to conceptualise HL in learning, the author agrees that schools are rich with potential to support mindsets in adolescents to not only make decisions and take actions, but to bounce back from challenges and adversity, grasp opportunities when they arise, and to understand that some mistakes can be resolved whilst others are life changing (Paakkari *et al.*, 2015; St Leger, 2001; WHO, 1999). This potential can prepare adolescent populations with knowledge and skills to critically engage and deal with the health challenges they face now and in the future. This paper has specifically responded to the research question underpinning the study, providing pedagogical examples as to how the PsTs at the author's ITEI progressed HL competencies. The examples shared in this paper were to promote greater clarity of HL pedagogical development with other ITEIs. This in turn, aimed to support the creation of learning in schools to lead to dispositions whereby adolescents feel confident to communicate health concerns, question health information, position themselves and others as healthy or unhealthy, benefit from accessing of health care services and feel empowered to act ethically and responsibly to enhance personal, social, community and societal health.

In the specific context of sun safety education, this study has shared pedagogical insight as to what could work to support change, both within Australia and in other countries. This is especially pertinent to those countries where education appears to be a limiting rather than an enabling factor. To do so the paper highlighted the significance of initial teacher education as a capacity building institution with potential to support a downward trend in melanoma and non-melanoma incidence, specifically with adolescents. The work discussed here, could be applied to other health contexts and settings, especially those that are school based like early childhood settings where the fore mentioned response to COVID 19 to social distance remains critical. Moreover, the

*Health Literacy Enabling Framework for School Curriculum* could be applied universally as a pedagogical tool supporting PsTs and experienced teachers to prepare HL learning ‘for’ and ‘about’ health as per AITSL’s policy framework (2011).

In concluding, the author would like to address a limitation of the study. The scope of the study is not enough to qualify the good work of Paakkari and Paakkari (2012) with schools and at other ITEIs. As such, she reaches out to likeminded scholars, especially those in countries with high incidences of skin cancer, to join her in furthering pedagogical insight by conducting research to qualify the capacity of schools and ITEIs as enablers of HL in adolescents. The author also encourages everyone to participate in ongoing and life-long self-efficacy toward sun behaviour, especially those who care, take charge and are role models for our young.

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