School-based health literacy for children and young people in Wales: A review of existing evidence, international case studies and monitoring and tracking tools

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Introduction

Health literacy, a modifiable factor that contributes to the promotion and maintenance of health and well-being throughout an individual's life has been identified as a global priority by the WHO [1]. It is recognised as one of three crucial pillars for achieving the 2030 UN Sustainable Development Goals and health equity [1], and has received significant interest and growth across international policy [2]. In Wales, it is a named Area of Research Interest (ARI) for Senedd Cymru [3], the Welsh legislature. This follows the increasing prominence of health within existing and emerging policy and strategy spanning health and social care, economy and education in Wales [4]. The definition in Wales adopted in 2010 is "*the ability and motivation level of an individual to access, understand, communicate and evaluate both narrative and numeric information to promote, manage and improve their health status throughout their lifetime*" [5]. Progress in this area in Wales has stalled since publication of this scoping review in 2010, but it is clear there is significant policy appetite for driving health literacy [3,6].

Nutbeam's [7] typology of health literacy constitutes three hierarchical layers; *functional*, *interactive* and *critical* health literacy, these domains progress from basic cognitive skills through to communicative and more advanced appraisal and analysis of health information. He argues that enhancing health literacy and particularly, critical health literacy should be viewed as an asset through means of empowerment, enabling individuals to exert greater control over their health and make health-enhancing decisions [8]. Following on from the publications of the phase one report *Health, Education and Prosperity for All: Wales as a Health Literacy Testbed* [4], this full phase two report aims to provide an overview of the latest research and evidence base on health literacy in relation to children and young people, with a focus on school-based approaches, international curriculum case studies and tools for monitoring and tracking health literacy.

Report overview

This report presents a summary of evidence from systematic and scoping reviews of children and young people's general health literacy with a focus on school-based approaches. It aims to explore barriers and opportunities for embedding health literacy as a theoretical framework, learning outcome and marker of progression for curriculum design and implementation within the *Curriculum for Wales (CfW)*. Collating key findings from these reviews are of particular importance within areas of emerging research or where research is lacking. Summarising this existing evidence base can identify gaps in knowledge, inform further research, and highlight areas for consideration and recommendations for emerging research, policy and practice. The following section provides a contextual overview of schools as a key setting and health literacy as a learning outcome, highlighting opportunities and challenges. The report is then structured into three components:

- Systematic, scoping and integrative reviews of school-based approaches to children and young people's health literacy;
- International health literacy curriculum case studies; a lens on Australia and Finland;
- Tools for tracking and monitoring health literacy of school-aged children.

Based on these key findings, the report concludes with considerations, recommendations and areas for action within research, policy and practice.

Schools as a key setting for health literacy

Developing health literacy is a lifelong process that should begin in early childhood. The WHO advocate that health literacy "*must be an integral part of the skills and competencies developed over a lifetime, first and foremost through the school curriculum*" [1]. As such, attention and research focusing on health literacy in children and young people is primarily framed within school contexts. Schools provide access to large populations from a range of socioeconomic backgrounds, thus have potential to equalize societal differences caused by out-of-school settings and offer an ideal platform for reducing inequalities and inequities in health and health literacy [9]. They are one of the key settings where children and young people obtain health information from and for wider health promotion activities to be targeted [10]. Not only this but enhancing health literacy within formal educational settings offer opportunities for distributed and collective health literacy, transferring knowledge and skills between families, social networks, generations and communities as a form of social and cultural capital [11]. This opportunity may also be highlighted post-COVID-19 pandemic, where there is increasing public and policy awareness of societal population health-level challenges, especially in Wales [12–16].

The common goals and purposes of both education and health literacy are interwoven [17]. This overlap includes "*helping children, adolescents and young people to grow into critical thinkers and problem-solvers, to be ethically responsible, autonomous and independent, to be life-long learners and empowered citizens, and to be able to make informed decisions about their own lives and health and that of others*" [18]. Indeed, this quote from the WHO has strong alignment with the visions and four purposes of the *CfW* [19]. Schools are key agents in developing children's knowledge, skills, competencies and agency to make health-enhancing decisions as health literate citizens, developing their *functional*, *interactive* and *critical* health literacy for personal empowerment and act as autonomous citizens [20,21].

However, the WHO state that evidence-based approaches to improving health literacy in schools are lacking in many countries across Europe [18]. This, in part, is due to research placed more heavily on adult populations in recent decades, with research on children and young people only gaining momentum in the last 5-10 years. Furthermore, health and health literacy has historically been viewed as competing with valuable curriculum time dedicated to more traditional measures of learning such as literacy and numeracy [22,23]. Approaches to prioritising learners' health include the WHO Health Promoting Schools (HPS) Framework [24] which focuses on three components; the formal curricula, school environments and engaging with families and communities. However, this has encountered challenges, with the authors of a systematic review stating that "*interventions are more likely to be successful and scaled up if educationalists are convinced it will contribute to the core mission of schools: to educate students*" [25].

However, the global educational landscape is changing in response to rapid societal changes, wider perceptions of the overarching purposes of compulsory education, as well as the COVID-19 pandemic. Schools are now viewed predominantly as settings to develop children and young people's skills and competencies as citizens and equipping them with the resources to thrive in modern society. This overlap between the goals of health literacy and education [26] has led to health literacy being recognised as a key learning outcome in schools necessary to meet the demands of a complex society

[17,27]. The Organisation for Economic and Social Development's (OECD) *Future of Education and Skills 2030* [28] provides a framework for the knowledge, skills, attitudes and values learners require to thrive and shape their future. This includes health as a core foundation and developing health-literate students. In response, countries worldwide have introduced major curriculum reforms to facilitate children and young people in developing the key competencies required to meaningfully and effectively navigate a changing world [27]. Examples include Australia and Finland who through ongoing curriculum reforms have embedded health literacy as an overarching theoretical framework; these national case studies are explored in this report. This explicit integration of health literacy within these curricula aim to guide curriculum design and implementation, develop health-literate students and citizens, and promote critical thinking and empowerment for health-related decision making for themselves, others and society.

Recent significant education reform within Wales provides an avenue for health literacy as a learning outcome within the *CfW* [19], though there is no explicit reference to health literacy within curriculum guidance. Underpinned by its four overarching purposes, the *CfW* aims to equip every learner to meet the demands now, and in the future to become;

- ambitious, capable learners, ready to learn throughout their lives;
- enterprising, creative contributors, ready to play a full part in life and work;
- ethical, informed citizens of Wales and the world;
- healthy, confident individuals, ready to lead fulfilling lives as valued members of society.

A fundamental premise of the *CfW* is the school-level autonomy placed on designing, adopting and implementing curriculum guidance and overarching frameworks to realise these four purposes. Furthermore, Welsh Government guidance [29] emphasises that this flexibility in curriculum design must be underpinned by a robust evidence base. However, this school and teacher-level autonomy in curriculum design can result in challenges relating to the space between policy intent, core curriculum concepts and enacting these visions [30,31], especially in the context of "cynefin" (belonging) as articulated in the new *CfW* [32]. This flexibility offered to schools poses a risk of high degrees of variability in curriculum design. For concepts such as health literacy, variation of teachers' professional knowledge and confidence may exist due to minimal attention dedicated to health in teacher training and a lack of opportunities for ongoing professional development. A key concern of this autonomous curriculum design and implementation raised by experts is the paradoxical effect of its intention, rather than "*raise standards for all, tackle the attainment gap*" [33] there is potential it may further exacerbate inequalities [34].

The benefits of optimising the health literacy of children and young people are highlighted in the phase one report, *Health, Education and Prosperity for All: Wales as a Health Literacy Testbed* [4]. It is important for Wales to capitalise on this new statutory focus on health and well-being as an overarching curriculum purpose and one of the six Areas of Learning and Experience as an opportunity to enhance the health literacy for current and future generations, and consider frameworks that raise standards for all [4]. Designing and implementing the health and well-being curriculum through a health literacy theoretical framework can address challenges relating to policy fidelity, a lack of clear guidance and pedagogical support. This can provide an evidence-based approach to frame pedagogical training and guide curriculum development, as advocated for by the Welsh Government. This offers coherence in enacting guidance and tracking learner progression whilst ensuring the needs of learners are central to curriculum development. This also has implications for achieving the well-

being goals set out in the *Well-being of Future Generations (Wales) Act 2015* [35], particularly *A More Equal Wales* and *A Healthier Wales*.

This report considers health literacy as a learning process and outcome and aims to explore i) the barriers and facilitators of effective health literacy curriculum design and implementation; ii) examine international case studies of curriculum integration of health literacy; and iii) scope tracking and measurement tools of health literacy as a measure of learner progression and assessment. This can offer insights into frameworks for designing and implementing a curriculum of health and well-being to enhance health literacy to develop *healthy, confident individuals* who can meet the demands of a complex society now and in the future.

Conceptual overview: Health literacy as a learning outcome

First, it is useful to consider the concept of health literacy framed within the target group and setting; specifically, children and young people within the school context and as a learning outcome. Despite significant growth of health literacy research over the last few decades, the attention to children and young people has only recently gained momentum, particularly within the last 5-10 years. In order to develop, address and evaluate efforts to improve children and young people's health literacy, a sound understanding of health literacy as a learning outcome construct within this target group is required.
The lens that health literacy is viewed and applied is highly concept and construct specific. For example, health literacy needs and competencies vary across clinical or health care settings, wider health systems, public health and health promotion, or within education. Within education, the work of Paakkari and Paakkari (2012) is relevant when considering health literacy as a learning outcome. Their work developed a framework for health literacy as a learning outcome and identified five core components of learning conditions required to develop health literacy in schools:

- Theoretical knowledge;
- Practical knowledge;
- Critical thinking;
- Self-awareness;
- Citizenship.

These components represent progression from *functional*, *interactive* to *critical* health literacy domains, and are essential components to consider in the context of the *CfW*. These could be considered as a framework for curriculum design of the *Health and Well-being Area of Learning and Experience*, enabling learners to become *healthy, confident individuals* and as domains to track progression through the continuum of learning in relation to progression steps and advancing to higher levels of health literacy. Thus, flexibility is maintained regarding curriculum content aligned to learners' needs, but an overarching framework can guide a more coherent design of the *Health and Well-being* Area of Learning Experience across educational settings in Wales.

Theoretical knowledge regarding basic factual information, concepts and principles of health is required to develop a deep understanding of health issues and understanding links between different health topics. This construct represents functional health literacy, for example, being able to memorize, name, list or describe health concepts. Whilst knowledge alone may not encourage health-promoting behaviour change, it is the foundational component of health literacy. Theoretical

knowledge regarding key health issues and topics can be implemented within school curricula, particularly embedded through the *CfW Health and Well-being Area of Learning and Experience*. The fundamental components of this curriculum area are physical health and development, mental health, and emotional and social well-being. It aims to "*support learners to understand and appreciate how the different components of health and well-being are interconnected, and it recognises that good health and well-being are important to enable successful learning*" [36].

Building on theoretical knowledge is **practical knowledge**, the second core component of health literacy as a learning outcome. This domain is viewed experientially through application of theoretical knowledge in specific, usable situations as a health-related skill. Thus, possessing foundational theoretical knowledge is important, but this is extended as an action-based competency or capability. Experiential learning opportunities through constructivist approaches afforded by the *CfW* can enable practical knowledge application. Focus is placed on authentic and purposeful learning through "*relevant and meaningful experiences that are rooted in real-life contexts will enable learners to make connections, apply knowledge and consolidate skills*", thus promoting the development and application of practical knowledge [37].

The third component of health literacy as a learning outcome, **critical thinking**, is by recognised Paakkari and Paakkari [17] as the curious and investigative element. This includes critically evaluating the credibility of sources of theoretical knowledge such as fact, opinion and scientific information, and for practical knowledge searching for valid and reliable sources of health information. This is also important in understanding health in different contexts, for example through the lens of social influences and wider determinants. Indeed, the *CfW* encourages pedagogy that helps learners to develop critical, creative, problem-solving skills. Within the health and well-being curriculum area, guidance calls for learners to develop the critical-thinking skills necessary to consider their decision-making, and to engage critically with the social influences of their health and well-being and the health and well-being of others.

Self-awareness for health literacy as a learning outcome focuses on the ability to self-reflect on feelings, needs, motives, values, attitudes, and experiences to inform health decision making. The authors encourage self-awareness as a precursor to setting meaningful and manageable goals regarding their health, developing strategies and reflecting on their physical and social surroundings that meet the needs of these goals. This is reflected throughout the *CfW* guidance. For example, in relation to the Statements of What Matters, including recognising feelings and emotions in order to develop strategies for emotional regulation (relating to well-being) and understanding factors that affect health and well-being to "*develop positive, informed behaviours that encourage them both to care for and respect themselves and others*".

Finally, the component of **citizenship**, acting in an ethically responsible way and taking social responsibility by considering consequences of actions on others and the world. This has strong alignment with the *CfW*, and particularly the overarching purpose of becoming "*ethical, informed citizens of Wales and the world*". This also has implications for collective health literacy and organisational health literacy, encouraging children and young people to advocate for system-level changes and participate in promoting collective good and improving the health literacy of their community and wider.

There are clear links between the *CfW* guidance on the *Health and Well-being Area of Learning and Experience* and the five components of health literacy as a learning outcome. Given the broad guidance relating to this curriculum area, it is unclear how this will be enacted in practice in educational settings across Wales. It likely requires significant and sustained investment in professional learning, teacher training and on-going pedagogical support specifically for this area of the curriculum. There are many strengths in avoiding an overly prescriptive curriculum and rather providing autonomy to schools in curriculum design, as is the case in Wales. However, with broad guidance comes a risk of large variation of curriculum design and provision [34]. Embedding a health literacy theoretical framework to guide teaching, learning and assessment may minimise the variation expected in curriculum implementation and streamline markers of assessment to track learning progression and curriculum impact locally, regionally and nationally.

Furthermore, the *CfW* does not include health literacy as an explicit theoretical framework within the school curriculum, despite health literacy's position within curriculum guidance as both a driver to structure curriculum design and an outcome to track learning progression and impact. Using these five components of health literacy as a learning outcome can act as a guide in curricula frameworks, this can inform the design and implementation of curricula and enable targeted monitoring and tracking across the five domains. Such approaches are embedded within curricula internationally, for example within countries such as Finland, this is discussed later in this report as a case study.

Mixed methods research is required to scope how curriculum design and implementation are structured regarding the *Health and Well-being Area of Learning and Experience*, and scope the potential in using the conceptual framework of health literacy as a learning outcome to underpin curriculum design more universally.

Systematic, scoping and integrative reviews of school-based approaches to children and young people's health literacy

The following section summarises evidence and key points from recent systematic, scoping and integrative reviews, discussed in order of publication year. Key points from collating evidence within these reviews are also summarised at the end of this report as areas for consideration across research, policy and practice.

Implementation of school health literacy in Australia: A systematic review (Peralta and Rowling 2017)

Health literacy was prioritised as a key foundation of the renewed 2014 *Australian Curriculum for Health and Physical Education* [38]. This shift towards explicit underpinning of health literacy addressed historical school-based barriers, and provided a clear framework of health literacy aligning to subject matter and learning outcomes. Peralta and Rowling [38] sought to review school-based adolescent health literacy programmes, examining their evidence base, examples of good practice and alignment with the Australian Curriculum. Of the three studies identified, the authors noted a lack of theoretical frameworks underpinning the design of health literacy programmes. The study that was theoretically informed, based on Nutbeam's [7] conceptualisation of health literacy and involved the three dimensions of the WHO HPS Framework showed improvements in health literacy and was

viewed as acceptable by key stakeholders. This review identified important factors for consideration, this includes teacher professional development and professional learning highlighted as imperative for delivering this paradigm shift towards health literacy. Other essential factors include a lack of school leadership and the importance of embedding health literacy within the school mission, aims and policies. The importance of schools' leadership in school health promotion has been highlighted for decades, with recent evidence emphasising school leaders considering health promotion as an integral part of their educational core mission and their leadership responsibility [39].

Health Literacy in Schools? A Systematic Review of Health-Related Interventions Aimed at Disadvantaged Adolescents (Smith et al., 2021)

A systematic review from Smith and colleagues [40] examined school-based health literacy interventions targeting socioeconomically disadvantaged adolescents aged 12-18 in order to identify effective intervention strategies. 41 articles were identified for review, these studies were primarily concerned with health-related behaviours including multi-component (e.g. multiple behaviours such as physical activity and diet) and single domain focus. Overall, there was large variation in research designs, aims, components, outcome measures and effects, and few measured intervention fidelity (e.g. understanding the implementation process). An important aspect identified was the basis of behavioural change theory or theoretical underpinning. This was incorporated in just under half (n=20) of articles identified, and of all articles just one focused on Nutbeam's [7] conceptualisation of critical health literacy, critically analysing and using health information to exert greater control over one's health and life.

Based on the 41 articles identified, the authors summarised effective intervention strategies. Promisingly, these strategies also align with pedagogical guidance within the *CfW*. Firstly, those that incorporated 'hands-on' elements and practical learning components produced more favourable outcomes. For example, those targeting aspects of social and emotional outcomes included mindfulness activities, and those targeting dietary behaviours embedded practical cooking opportunities. This can be interpreted in relation to Nutbeam's [7] hierarchical conceptualisation of health literacy spanning functional, interactive and critical. Practical learning activities may facilitate development of the interactive element, more advanced cognitive literacy skills, this aligns with the practical knowledge domain of health literacy as a learning outcome [17]. In relation to the *CfW*, pedagogical guidance emphasises the importance of authentic and purposeful learning, providing learning experiences that "*encourage learners to investigate, explore, create and be active participants in their learning*" [37].

Peer support and involvement was highlighted as another effective intervention strategy, this included peer-led activities, modelling, feedback and involvement. The importance of peer support is highlighted within wider research, whereby health behaviours cluster within peer groups, and peer relationships can have both positive and negative influences on health behaviours [41]. Indeed, social support offers informal and formal structures for distributed health literacy. In one article identified within the review by Smith *et al.* [40], peers were involved in the design and delivery of interventions which saw improvements to health literacy. This can also be achieved through the *CfW* which its focus on *learner-centred pedagogy,* recognised as "*the approach of allowing learners to take responsibility for and make choices about what they will learn*". Grounded in elements of social constructivism, collaborative learning is also featured within pedagogical guidance for the *CfW,* with one of the 12 pedagogical principles that "encourages collaboration" and providing learning experiences that

"*support learners to begin to work collaboratively to solve problems*". Finally, holistic approaches were identified as effective. Examples of holistic approaches are those that are multi-component, for example all, or a combination of an educational component (e.g. curriculum topic or specific learning outcome), school environment (e.g. wider school policy or design) and engaging with families and/or communities. This holistic approach embodies the three principles of the WHO HPS Framework: the formal curricula, school environments, and engaging with families and communities. The authors concluded that targeting all three components produced greatest benefit, and targeting two of the three components still produced significant intervention results compared to focusing solely on one HPS component. These findings further support the review by Peralta and Rowling [38], who state the importance of approaches to health literacy embodying the three dimensions of the HPS Framework.

Again, the authors advocated the importance of teacher training and pedagogical guidance for health literacy-informed curricula approaches. As with other studies, the authors highlighted the dearth of assessment tools in capturing health literacy within this population group and in return, a lack of studies using health literacy as the primary outcome (rather, it is assumed a secondary by-product). Scalable assessment measures enable tailored intervention design, basing the development on the key intervention features highlighted above.

School-Based Health Literacy Programs for Children (2-16 Years): An International Review (Nash et al., 2021)

The work of Nash et al. [42] aimed to explore the characteristics of school-based health literacy programmes for children and young people aged 2-16 to identify effective pedagogical approaches. Their literature search identified 21 articles, and similarly to other reviews these were heavily weighted towards secondary schools targeting early to late adolescent age (13-18 years). Less than a third of studies reviewed were conducted in primary school settings, again owing to the lack of measurement and research focus in younger child populations.

There was large variation in health literacy programme design and measurement, likely this is reflective of the context and content-specific influence of health literacy definitions and models. Only two of programmes reviewed considered holistic, whole-school approaches to health literacy. As suggested in previous reviews, it is important for health literacy programmes to be underpinned by the three domains of the WHO HPS Framework (curricula, school environment, family/community engagement) for greatest benefit, long-term behaviour change and distributed health literacy.

In agreement with the work of Peralta and Rowling [38] and also discussed by Smith *et al.* [40], teachers' professional development was highlighted as imperative; less than half of the studies in the review by Nash *et al.* [42] incorporated opportunities for upskilling the education workforce. Furthermore, the authors advocated for dedicated time for planning and collaborative teaching regarding pedagogical approaches to health literacy, supported further by school leadership. Current initial teacher training in Wales now includes elements of health and well-being in line with the *CfW* purposes and *Area of Learning and Experience.* However, it is unclear as to the time, resources and relevance to health literacy dedicated, or opportunities for ongoing professional learning. Thus, the preparedness of the current and future cohort of teachers in Wales to design and implement a curriculum of health and well-being is relatively unclear and research is required. Factors that were conducive to effective school-based health literacy programmes identified within this review mirror the ideals of the *CfW*. This includes the importance of co-designed, pupil-centred and participatory

approaches to design, implementation and evaluation of programmes. These must be age-appropriate and context-relevant, again, this fits within the *CfW* focus on a continuum of learning and school-level curriculum design relevant to contexts and communities. Pedagogical methods should facilitate inquiry-based, active learning and constructivist approaches, all positioned within the 12 pedagogical principles of the *CfW*. This also supports the conditions for health literacy as a learning outcome identified by Paakkari and Paakkari [17]: *theoretical knowledge, practical knowledge, critical thinking, self-awareness, and citizenship*. These facilitate deeper, reflective learning and development of critical thinking skills and application to real world contexts. This is essential for young children to develop the necessary knowledge and skills to be empowered to make decisions that impact their current and future health. Further, health literacy programmes will offer greatest benefit when delivered as cross-curricular and integrated approaches rather than in silo as health education, this directly aligns to the wider visions and principles of the *CfW* as a broad and balanced approach to developing learners' competencies and capacities as citizens of Wales.

The conceptualization and development of critical health literacy in children: a scoping review (Jenkins et al., 2022)

Jenkins *et al.* [43] recently published a scoping review examining the critical domain of Nutbeam's health literacy typology; critically analysing and using health information to exert greater control over one's health and life. With previous reviews focusing on adolescence, this review provides an important contribution to the limited evidence base on middle childhood (aged 7-11).

Critical health literacy is viewed as an "asset" for informed decision making due to the development of higher level cognitive and social skills [44]. Indeed, critical health literacy is a neglected area of focus within educational settings and across the research landscape. Typically, health literacy curriculum activities are weighted towards knowledge development relevant for functional health literacy, with less attention paid to learning opportunities to develop a critical level of understanding. This is despite wider evidence suggesting that persisting disparities in health are likely due, in part, to critical domains of health literacy and thus, this underestimates the true contribution of health literacy to inequalities and inequities [45]. Therefore, the review by Jenkins *et al.* [43] is well positioned within this gap and aimed to explore and conceptualise critical health literacy in children aged 7-11.

In total, 18 papers conceptualising critical health literacy in children aged 7-11 were identified and synthesised, of which 15 studies were conducted within schools and the majority based in Australia. This is reflective of the research response to the centrality of critical health literacy within the reformed *Australian Curriculum for Health and Physical Education* (discussed as a case study below). Further supporting previous reviews highlighting the importance of participant involvement and child-led approaches, studies identified by Jenkins *et al.* [43] used the *Investigation-Visions-Action-Change* (IVAC) model;. This methodological approach aligns with the visions of the *CfW*; the IVAC is underpinned by an action-orientated belief that teaching should contribute to the development of abilities and competencies to influence local and global environmental problems [46]. Indeed, a distinguishing feature of critical health literacy is its focus on social action, enabling children to understand the social determinants of health literacy and view it through a socio-cultural lens. Jenkins *et al.* [43] discuss the challenges of school-based interventions in developing critical health literacy, with the majority failing to enhance the critical domain and instead, reducing outcomes to functional health literacy development. This is likely attributed to variations in curriculum design, structural and time constraints and a tendency for pedagogy to focus on cognitive skills as opposed to practical

action. The authors advocate for schools to ensure pedagogy promotes critical discussion and child agency, using cross-curricular approaches and engaging with other settings and the community. Indeed, guidance surrounding the *CfW* relating to curriculum design and pedagogical approaches may address some of the challenges highlighted by Jenkins *et al.* (2022). For example, the perspective that schools are limited in their opportunities for action-oriented critical health literacy may not apply within Wales; the *CfW* encourages that "*real-life experiences can enable learners to take the lead in asking questions, identifying problems, taking risks and finding solutions*".

Thus, these opportunities to develop critical health literacy of children in Wales are possible through the *CfW*. For example, progression within the *Health and Well-being Area of Learning and Experience* requires learners to move through the continuum of learning towards; "*developing conceptual knowledge and critical understanding in a range of aspects of health and well-being and personal behaviour*" and *"progress from primarily considering themselves, to considering others, both in their own relationships with others and in wider local, national and international contexts"* [36].

International curriculum case studies

Many countries worldwide have either undergone or are currently in the process of significant curriculum and education-system level reforms to provide children and young people with the competencies to thrive in a changing world. This section discusses two international curriculum case studies: Australia and Finland, both of which have embedded health literacy within their formal curriculum as a key process and learning outcome. These are important to consider in the context of the *CfW* which provides opportunities to guide development of the *Health and Well-being Area of Learning and Experience* to the framework of health literacy.

Australia

Australia was one of the first education systems worldwide to integrate health literacy as a core element within educational policy and practice. '*Develop 'health literacy skills'* is one of five theoretical underpinnings of the reformed Australian Curriculum: Health and Physical Education [47]. Conceptualisation of health literacy within the Australian curriculum is framed around Nutbeam's [7] typology of functional, interactive and critical health literacy, with an emphasis placed on the latter. This focus towards developing critical health literacy is reflected within the aims of the reformed Australian Curriculum including:

- *"Learn to individually and collaboratively access, evaluate and synthesise information, make decisions, seek help and take actions to protect, enhance and advocate for their own and others' health and well-being*";
- "*Analyse how personal, social, cultural, economic, technological and environmental factors shape health..."* [48]

The delivery of health literacy teaching and learning is achieved through the curriculum strand "*Personal, social and community health*", with three key principles for enacting this strand grounded in the roots of critical health literacy. Namely i) "*Being healthy and safe*"; ii) "*Communicating and interacting for health and well-being*"; and iii) "*Contributing to healthy and active communities"*. There is some overlap with the *CfW* Statements of What Matters and Descriptions of Learning and this case

study, particularly with the focus of learning for each strand on acquiring *knowledge*, *skills* and *understanding.* Further, health literacy within the Australian curriculum is framed in the socio-ecological model of health. That is, not solely viewing health literacy as individualistic but rather, that individuals are embedded within wider social and cultural constructs [49]. Indeed, health literacy is a context-specific competency, and is deeply influenced by personal, social and environmental determinants spanning settings, systems and policies.

Possible challenges anticipated by scholars in Australia prior to curriculum rollout mirror some of those that the *CfW* posits, particularly in relation to the space between "*pedagogical intent and enactment*". Teachers are key policy actors in translating educational policy to meaningful practice, shaping future educational policy and in curriculum realisation. First, they highlight the uncertainty of how teaching and learning of health literacy is likely to be implemented in schools when based on a broad set of guidance, the same could be viewed regarding pedagogical delivery of the *Health and Well-being Area of Learning and Experience*. Secondly, the importance of explicit mention of health literacy and its domains throughout curriculum guidance (in the context of Wales, this would include the Statements of What Matters, Descriptions of Learning, for example) ensures it diffuses across all aspects of teaching and learning. These challenges have been posed by authors in Wales ahead of *CfW* rollout, including the work of Power and colleagues [34].

Finally, the authors advocate for qualitative research with teachers to explore their perspectives of interpretations of broad curriculum guidance, and how their experience and values influence implementation. Research following curriculum rollout explored how teachers interpreted and enacted the proponents of the curriculum. Findings by Lambert and Penney [50] highlighted that out of the five propositions, '*Develop health literacy*' received the most limited commentary from educators, this was attributed to the high degree of guidance offered by framing health literacy within Nutbeam's [7] functional, interactive and critical typology. Thus, whilst there are merits to broad approaches, providing a clear framework for teachers to map curriculum activities may aid fidelity. This is an area for further research in Wales, particularly considering new statutory focus on Health and Well-being without previous pedagogical training on such topics. Alfrey and Brown [48] encourage extensive support and training including ongoing professional learning and integration within existing undergraduate and postgraduate teacher training to maintain curriculum fidelity.

The authors propose the need for "*guiding principles*" or "*models of teaching*" to maintain fluidity between guidance and curriculum enactment. One possible approach in addressing some of these challenges within the *CfW*, is incorporating the five components of health literacy as a learning outcome proposed by Paakkari and Paakkari [17]; theoretical knowledge, practical knowledge, critical thinking, self-awareness and citizenship. These form the theoretical underpinning of the curriculum for health literacy in Finland, explored as a case study below, and could be mapped to current curriculum guidance in Wales concerning the Health and Well-being Area to provide a focused and coherent approach to curriculum design, implementation and monitoring.

Finland

Educational reform in Finland in 2014 (with curriculum roll-out from 2016) aimed to develop a new curriculum in response to rapid societal changes spanning environmental issues, globalisation and technological development. As has the *CfW*, the Finnish curriculum shifted away from specific content in the direction of a broader, competency-based curriculum. Whilst health education was an existing

subject within the curriculum since 2004, the reform identified health literacy as key competence required by children and young people to meet the demands of modern society [51].

In response, the reformed curriculum adopted health literacy as the overarching theoretical framework of teaching criteria and learning objectives relating to health education, i.e. health education as the tool to enhance health literacy through. Whilst health education is a standalone subject, it is delivered as a component of wider, integrated topics including environmental studies, and there are a number of cross-curricular competencies to be addressed including *taking care of oneself and managing daily life.*

The curriculum theoretical framework is divided into the five health literacy learning components developed by Paakkari and Paakkari [17]; **theoretical knowledge, practical knowledge, critical thinking, self-awareness, and citizenship**. These apply to all children within formal schooling from ages 7-16, reflecting the importance of developing the full range of health literacy competencies in an age-appropriate manner throughout the compulsory schooling system.

Age-differentiated learning goals are set for each of the health literacy competencies, with criteria for knowledge and skills for different elements used to track development and progression through the domains (further examples of age-differentiated criteria can be viewed in Paakkari and Paakkari [51]). This is seen as a method to further support learning using a learner-centred approach. Assessment includes opportunities for self-assessment, peer assessment and reflection to encourage the pupils to develop their health literacy. This assessment focuses on knowledge and skills regarding health literacy, as opposed to behaviour and attitudes (e.g. avoiding measurement of health behaviours as the outcome for health literacy). Whilst there remains merit in tracking children's health behaviours and this is still measured by some schools in Finland, this must be complemented by understanding the overarching health literacy and self-awareness of pupils which influences the decision-making process.

An important point to note within this Finnish curriculum case study is the recognition of the professional demands and teacher training required for new ways of working to deliver and assess health literacy within schools. As such, health literacy and health education are embedded within teacher training programmes, with focus placed on "*research, content knowledge, pedagogical content knowledge, and interactive skills, ethical awareness, knowledge of the pupils as learners, the teacher's self-knowledge, and knowledge of the school as an operational environment*" [51]. This is an important consideration in the context of Wales. Whilst elements of health literacy and wider health promotion are incorporated into current Initial Teacher Education (ITE) provision for example, within Swansea University's Exploring *Pedagogy, Curriculum and Assessment in the Primary School* module [52], the time allocated is limited given the wider competing demands of teacher training programmes within the seven ITE partnerships [53]. This is coupled with limited opportunities for continuing professional development activities for the current educational workforce of almost 25,000 teachers in Wales [54]. Whilst there is focus on professional learning as a fundamental component of the *CfW,* and six In-service training days (INSET) per year, the extent to which these encompass training on the domains of health literacy is unknown. This requires qualitative research with trainee and qualified teachers with varying experience to explore knowledge and confidence in delivering the *Health and Well-being Area of Learning and Experience.*

Health literacy: Tracking and monitoring

A common thread amongst the reviews listed above is a dearth of gold standard approaches examining the health literacy of children and young people, with a significant gap in tools suitable below adolescence age (typically aged 12 and below). This is demonstrated in the work of Okan *et al.* [55] and Guo *et al.* [56] who reviewed health literacy tools in childhood populations. Between both systematic reviews, 29 separate measures were identified. It is outside the scope of this report to summarise all instruments identified in these reviews. However, as a summary, most tools identified were used in age groups older than 11 years, many were designed for use in adult populations with a lack of age-related adjustments. A large number developed for the purpose of a specific study with a lack of validation testing or relevance in other contexts. There was variation in methodological approaches (e.g. survey, face-to-face), language, and the focus on either general or specific domains of health literacy concepts. Furthermore, in line with the work of Jenkins *et al.* [43] the large majority of tools examined functional health literacy with little attention paid to interactive or critical domains [7]. Finally, whilst most of the tools were for administration within school settings, these included measures containing a significant number of items and response times exceeding 60 minutes for participation. An essential consideration for school-based measures is the provision of brief, age-appropriate tools to minimise burden to participants, particularly within primary school contexts

The most widely used tools in Europe currently are the Health Literacy for School Aged Children (HLSAC) [57], the European Health Literacy Survey for children (HLS-Child-15) [58] and the Health Literacy Assessment Tool (HLAT-8) [59]. Importantly, the 10-item HLSAC captures health literacy in terms of the conceptualization of health literacy as a learning outcome by Paakkari and Paakkari [17] (theoretical knowledge, practical knowledge, critical thinking, self-awareness, citizenship). It is integrated within the Health Behaviour of School-Aged Survey (HBSC) in some European countries . Most recently, a shorter version (HLSAC-5) has been validated for children aged 13 and above which shows promise as a brief measure health literacy in school-aged children [60]. However, further research is required in the feasibility of this tool in younger populations, particularly in primary school age.

The HLS-Child-15 is an age-adapted version of the European Health Literacy Survey for adults (HLS-EU-Q), a broad measure of self-reported participants' perceived difficulty in accessing, understanding, appraising, and applying health information. As this is an adapted version of a widely used validated survey for adults, this provides opportunities for tracking through the life course. It has been validated for use in German speaking child populations to age 9 [58] and translated to various languages in including English, French and Dutch enabling cross-European comparisons. However, as it contains 15 items it may not be feasible to incorporate within existing health-related national surveys such as The HAPPEN Survey [61–63].

Strengths of the HLAT-8 include its brief capture (8 items) of the three domains of functional, interactive and critical health literacy, and compared to other tools it shows best construct validity [56]. Whilst the review by Guo *et al.* [56] demonstrates evidence that encourages school-based use of the HLAT-8 for child and adolescent health literacy, it has not been validated for children under the age of 18 and thus readability and measurement properties require urgent testing. Thus, despite progress in the development of measures, there remains a significant gap in a brief, validated, age-appropriate tool for use in children below the age of 11 [64].

There is also currently no assessment of health literacy of children and young people underway in Wales. Furthermore, this scarcity of measurement tools suitable for younger children inhibits our understanding of children's health literacy and potential to track curriculum impact. Despite strengths of a broad and autonomous approach to teaching, learning and assessment within the *CfW,* this opens possibilities of variation and equity in curriculum provision and approaches to assessment of learning progression, preventing local, regional and national tracking and comparisons. There is potential to pilot the use of the HLSAC-5 in capturing the health literacy in children and young people in Wales.

It is paramount that monitoring and evaluation methods are embedded throughout the life cycle of curricula development, this can inform the iterative refinement and development aligned to the health literacy needs of children and young people. If health literacy is to be embedded as a learning outcome in schools for all ages within compulsory education, it is essential that valid, age-appropriate and school-based tools are available to monitor and track outcomes and measure learning progression. It is essential that tools are suitable in educational contexts and align with curriculum guidance and markers of learning progression. As health literacy is both content and context-specific, the development of a tool suitable for the Welsh context specifically aligned to the *CfW* is required. Whilst this presents challenges relating to school-level curriculum design and implementation, mapping a measure to general curriculum guidance/purposes/Areas/descriptions of learning is possible. This can be used to track learning progression within *the Health and Well-being Area of Learning and Experience* and impact on general health literacy. The use of scalable, health-related self-report surveys within schools in Wales are demonstrated with high uptake. These include the HAPPEN Wales platform [62,63]. Incorporating brief measures of general health literacy within existing, established nationwide surveys is a feasible avenue to explore. This would also facilitate evidence-based and rigorous research to advance our understanding of how to improve health literacy among children and young people, and how health literacy is related to engagement in wider health protecting or risk behaviours, especially post-pandemic [12–16]. Furthermore, tracking the impact of new statutory focus on health and well-being on health literacy enables understanding of the short- and long-term implications of curriculum reform. This can position Wales internationally as a national policy testbed case study [4].

Conclusion and recommendations

This review of school-based health literacy explores the barriers and opportunities to embed health literacy as a theoretical framework, learning outcome and marker of progression for curriculum design and implementation within the *CfW*. This report presents the collation of current evidence regarding theoretical frameworks of health literacy as a learning outcome, explores effective components of school-based health literacy, international curriculum case studies and tools for monitoring and tracking health literacy. Findings present several crucial challenges and opportunities for consideration across research, policy and practice. This report builds on the recommendations proposed by Marchant and Crick *in Health, Education and Prosperity for All: Wales as a Health Literacy Testbed* [4] and further highlights the opportunity for Wales to design, deliver and track national policy and position itself internationally as a leader in health literacy research, policy and practice.

It is clear there are many areas for opportunity and existing areas of good practice when considering health literacy's position within the *CfW*. The WHO [18] advocate that when structurally embedding health literacy in educational frameworks, design should consider how to meet complex demands in

a variety of contexts and across multiple areas; this is possible within the *CfW.* This includes its learner-centred approach, pedagogical principles that focus on authentic learning experiences considering real life contexts, and the school-level autonomy in curriculum design enabling tailored approaches to the personal, social and environmental determinants of health literacy at a school demographic/community level. However, autonomous approaches and flexibility in curriculum design results in a risk of high variation within the space between policy intentions and curriculum enactment. To address this, embedding health literacy as a theoretical framework can provide coherence in the design of the *Health and Well-being Area of Learning Experience* and streamline approaches to monitoring learner progression. This report concludes by summarising key points for consideration:

Whole-school approaches

Planning school-based health literacy activities are effective when integrated as whole-school activities involving the three domains of the WHO Health Promoting Schools Framework; the curriculum (e.g. *Health and Well-being Area of Learning and Experience*), school environment (integral component within school mission, vision and ethos, integrated within school policy and strategy), engaging with families/communities (e.g. model of Community Focused Schools [65]). This should be supported by school leadership at all levels and throughout all stages.

The Curriculum for Wales and OECD key competencies

The foundations of the *CfW* focused on skills and competencies aligns with the underlying constructs of health literacy as a competency for making health-related decisions for oneself and others. This is necessary for citizens to meet the demands of modern society and aligns with OECD key competencies "*contribute to valued outcomes for societies and individuals; help individuals meet important demands in a wide variety of contexts; and be important not just for specialists but for all individuals*". Thus, health literacy is a national priority to achieve curriculum visions, wider policy goals and prepare the next generation to navigate and meaningfully contribute to a changing society.

Theoretical framework

The strengths of broad curriculum guidance must be balanced with the expanse of possibilities in designing and implementing the *Health and Well-being Area of Learning and Experience*. Health literacy can provide a theoretical framework to structure curriculum design and markers of progression, specifically when aligned to the concept of health literacy as a learning outcome; *theoretical knowledge, practical knowledge, critical thinking, self-awareness, citizenshi*p. This can enhance fidelity of policy visions and curriculum enactment, providing the 'guiding principles' as suggested within Australian curriculum reform, and as implemented in Finland.

Critical health literacy domains

School-based health literacy approaches are weighted towards developing functional health literacy, with more advanced levels (interactive and critical) often overlooked. It is crucial to provide learning opportunities that develop critical health literacy, enabling greater autonomy and self-empowerment, this clearly aligns with the wider visions of the *CfW* to develop learners as citizens of Wales. This can

facilitate deeper, reflective learning and development of critical thinking skills and application to real world contexts. This is essential for young children to develop the necessary knowledge and skills to be empowered to make decisions that impact their current and future health and the lives of others.

Teachers as policy actors

Educational practitioners in Wales are key policy actors, responsible for translating educational policy to meaningful practice and curriculum realisation, and shaping future educational policy. Exploratory research is required with educational practitioners regarding the space between policy design, pedagogical intent and enactment of the *Health and Well-being Area of Learning and Experience*, a domain that receives minimal professional training. Possible research questions to understand and inform professional learning needs and provision include:

- *How do practitioner interpretations of the Health and Well-being Area of Learning and Experience guidance impact curriculum design and practice?*
- *What are practitioners' understanding and perspectives of health literacy's position within curriculum guidance?*
- *Is there equity in the provision of health and well-being activities given the high level of autonomy in curriculum design and does this impact health literacy?*
- *How confident do practitioners feel in this curriculum area, what is the extent of professional learning opportunities and how could they be better supported?*
- *What are their perspectives on the provision of an overarching theoretical framework of health literacy to structure curriculum design and implementation and guide teaching, learning and assessment?*

Professional learning and development

International case studies highlight the importance of professional learning and development, this is integral to teacher knowledge and confidence. Current training provision for ITE and education practitioners is limited, school-based health literacy is most effective when coupled with an ethos of ongoing professional development and training opportunities, driven by strong leadership. Thus, health literacy should be embedded within ITE and professional development training.

School leadership

Extending health literacy beyond curriculum design requires school leadership to drive forward a vision, embedding health and health literacy as fundamental components of school policy and strategy, and engaging with community stakeholders. Health promotion should be viewed by school leaders as an integral part of their educational core mission and leadership responsibility. This embodies the three principles of the WHO HPS Framework; the formal curricula, school environments and engaging with families and communities.

Gap in monitoring and tracking tools

There is a significant gap in measures suitable to track learning progression of health literacy, particularly in primary school contexts and below adolescence age. There is a need for an age-

appropriate and context-relevant, co-created/co-designed tool aligned to the curriculum. This would be strengthened in a curriculum underpinned by a theoretical framework and developing/validating tools that monitor framework domains. Integrating tools to existing national health-related surveys such as HAPPEN facilitates large-scale data collection [62,63]. Potential exists regarding the recent development and validation of the brief HLSAC-5 tool as a measure of school-aged children's health literacy, though this tool is currently only validated for children aged 13 and above.

Extend research capacity

Current international research attention is heavily placed on adolescent ages and secondary context (aged 11+), with a significant lack of focus to those under the age of 10 and in primary school contexts. The *CfW* offers opportunities for Wales to position itself internationally as research leaders in children's health literacy. Building on recommendations in the phase one report [4] the development of a multi-sector research, policy and practice Steering Group could inform future research direction and policy design.

Concluding statement

Wales has produced world-leading policy spanning health and social care, well-being, economics and education and positions itself globally as a tractable national-scale health literacy policy testbed. Building on the recommendations of *health literate* citizens, *health literate systems, health literate policies and health literate monitoring* in the phase one report [4], this report proposes integration of a health literacy framework [17] and health literacy as a learning outcome to guide policy implementation and delivery. In doing so, this can streamline *CfW* design, implementation, monitoring and tracking capabilities. It is essential to maximise this opportunity to strengthen and enhance health literacy capacity in Wales for the benefit of current and future generations.

References

1. World Health Organization. Shanghai Declaration on promoting health in the 2030 Agenda for Sustainable Development [Internet]. 2017 [cited 2024 Jan 5]. Available from: https://iris.who.int/bitstream/handle/10665/359526/WHO-NMH-PND-17.8-eng.pdf?sequence=1
2. Okan O, Bauer U, Levin-Zamir D, Pinheiro P, Sørensen K. International Handbook of Health Literacy: Research, practice and policy across the lifespan. Bristol: Policy Press; 2019.
3. Senedd Cymru. Area of Research Interest: Health Literacy [Internet]. 2022.
4. Marchant E, Crick T. Health, Education and Prosperity for All: Wales as a Health Literacy Testbed [Internet]. 2023 Nov [cited 2024 Mar 5]. Available from: https://business.senedd.wales/documents/s142587/Paper%202%20-%20Health%20Education%20and%20Prosperity%20for%20All%20Wales%20as%20a%20Health%20Literacy%20Testbed.pdf
5. Puntoni S. Health Literacy in Wales A scoping document for Wales. 2010 [cited 2023 Jan 12];
6. Senedd Cymru. Health and Social Care Committee Sixth Senedd Strategy. 2021.
7. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot Int [Internet]. 2000 Sep 1 [cited 2023 Oct 26];15(3):259–67. DOI: 10.1093/heapro/15.3.259.
8. Nutbeam D. The evolving concept of health literacy. Soc Sci Med. 2008 Dec;67(12):2072–8.
9. Paakkari L, Inchley J, Schulz A, Weber M, Okan O. Addressing health literacy in schools in the WHO European Region. Public Health Panorama [Internet]. 2019 Sep [cited 2024 Mar 5];5(2–3):186–9.
10. Brown S, Teufel J, Birch D. Early Adolescents Perceptions of Health and Health Literacy. Journal of School Health. 2006;77(1). DOI: https://doi.org/10.1111/j.1746-1561.2007.00156.x.
11. McQueen D V., Kickbusch I, Potvin L, Pelikan JM, Balbo L, Abel T. Health and modernity: The role of theory in health promotion [Internet]. Health and Modernity: The Role of Theory in Health Promotion. Springer New York; 2007 [cited 2023 Oct 26]. 1–170 p.
12. James M, Marchant E, Defeyter MA, Woodside J, Brophy S. Impact of school closures on the health and well-being of primary school children in Wales UK: a routine data linkage study using the HAPPEN Survey (2018-2020). BMJ Open [Internet]. 2021 Oct 8 [cited 2021 Nov 12];11(10). DOI: 10.1136/bmjopen-2021-051574.
13. Marchant E, Todd C, James M, Crick T, Dwyer R, Brophy S. Primary school staff perspectives of school closures due to COVID-19, experiences of schools reopening and recommendations for the future: A qualitative survey in Wales. PLoS One [Internet]. 2021 Dec 2 [cited 2022 Jan 20];16(12):e0260396. DOI: 10.1371/journal.pone.0260396.

14. James M, Jones H, Baig A, Marchant E, Waites T, Todd C, et al. Factors influencing wellbeing in young people during COVID-19: A survey with 6291 young people in Wales. PLoS One [Internet]. 2021 Dec 1 [cited 2022 Feb 22];16(12):e0260640. DOI: 10.1371/journal.pone.0260640.
15. Marchant E, Lowthian E, Crick T, Griffiths LJ, Fry R, Dadaczynski K, et al. Pre-COVID-19 pandemic health-related behaviours in children (2018–2020) and association with being tested for SARS-CoV-2 and testing positive for SARS-CoV-2 (2020–2021): a retrospective cohort study using survey data linked with routine health data in Wales, UK. BMJ Open [Internet]. 2022 Sep 1 [cited 2023 Oct 26];12(9):e061344. DOI: 10.1136/bmjopen-2022-061344.
16. Marchant E, Griffiths L, Crick T, Fry R, Hollinghurst J, James M, et al. COVID-19 mitigation measures in primary schools and association with infection and school staff wellbeing: An observational survey linked with routine data in Wales, UK. PLoS One [Internet]. 2022 Feb 1 [cited 2022 Jul 5];17(2):e0264023. DOI: 10.1371/journal.pone.0264023.
17. Paakkari L, Paakkari O. Health literacy as a learning outcome in schools. Health Educ. 2012 Feb;112(2):133–52. DOI: 10.1108/09654281211203411/full/xml.
18. World Health Organization. Health literacy in the context of health, well-being and learning outcomes the case of children and adolescents in schools: the case of children and adolescents in schools [Internet]. 2021 [cited 2023 Nov 1]. Available from: https://iris.who.int/handle/10665/344901
19. Welsh Government. Curriculum for Wales [Internet]. Education Wales. 2023 [cited 2023 Oct 26].
20. Kickbusch I. Health literacy: An essential skill for the twenty-first century. Health Educ. 2008 Feb 22;108(2):101–4. DOI: 10.1108/09654280810855559/full/pdf.
21. St. Leger L. Schools, health literacy and public health: possibilities and challenges. Health Promot Int [Internet]. 2001 Jun 1 [cited 2024 Mar 5];16(2):197–205. DOI: 10.1093/heapro/16.2.197.
22. Christian D, Todd C, Davies H, Rance J, Stratton G, Rapport F, et al. Community led active schools programme (CLASP) exploring the implementation of health interventions in primary schools: headteachers' perspectives. BMC Public Health. 2015;15(1):238. DOI: 10.1186/s12889-015-1557-0.
23. Todd C, Christian D, Davies H, Rance J, Stratton G, Rapport F, et al. Headteachers' prior beliefs on child health and their engagement in school based health interventions: a qualitative study. BMC Res Notes. 2015;18(8):161. DOI: 10.1186/s13104-015-1091-2.
24. World Health Organization. Health promoting schools [Internet]. [cited 2024 Mar 5].
25. Langford R, Bonell CP, Jones HE, Pouliou T, Murphy SM, Waters E, et al. The WHO Health Promoting School framework for improving the health and well-being of students and their academic achievement. Cochrane Database of Systematic Reviews. 2014;2014(4). DOI: 10.1002/14651858.cd008958.pub2.
26. Paakkari LT, Torppa MP, Paakkari OP, Välimaa RS, Ojala KSA, Tynjälä JA. Does health literacy explain the link between structural stratifiers and adolescent health? Eur J Public Health [Internet]. 2019 Oct 1 [cited 2024 Mar 5];29(5):919–24. DOI: 10.1093/eurpub/ckz011.

27. OECD. THE DEFINITION AND SELECTION OF KEY COMPETENCIES Executive Summary [Internet]. 2005 [cited 2024 Mar 5]. Available from: https://www.oecd.org/pisa/definition-selection-key-competencies-summary.pdf
28. OECD. CORE FOUNDATIONS CORE FOUNDATIONS FOR 2030: Conceptual learning framework [Internet]. 2019 [cited 2024 Mar 5]. Available from: www.oecd.org/education/2030-project
29. Welsh Government. Designing your curriculum: introduction [Internet]. 2020 [cited 2024 Mar 5].
30. Sinnema C, Nieveen N, Priestley M. Successful futures, successful curriculum: What can Wales learn from international curriculum reforms? Curric J [Internet]. 2020 Jun 1 [cited 2024 Mar 5];31(2):181–201. DOI: 10.1002/curj.17.
31. Harris A, Jones M, Crick T. Curriculum leadership: a critical contributor to school and system improvement. School Leadership & Management. 2020 Jan 1;40(1):1–4. DOI: 10.1080/13632434.2020.1704470.
32. Chapman S, Ellis R, Beauchamp G, Sheriff L, Stacey D, Waters-Davies J, et al. 'My picture is not in Wales': pupils' perceptions of cynefin (Belonging) in primary school curriculum development in Wales. Educ 3 13 [Internet]. 2023 Nov 17 [cited 2024 Mar 6];51(8):1214–28. DOI: 10.1080/03004279.2023.2229861.
33. Welsh Government. Education in Wales: Our national mission [Internet]. 2017 [cited 2023 Nov 21]. Available from: https://www.gov.wales/sites/default/files/publications/2018-03/education-in-wales-our-national-mission.pdf
34. Power S, Newton N, Taylor C. 'Successful futures' for all in Wales? The challenges of curriculum reform for addressing educational inequalities. Curric J [Internet]. 2020 Jun 1 [cited 2024 Mar 5];31(2):317–33. DOI: 10.1002/curj.39.
35. Welsh Government. Well-being of Future Generations (Wales) Act 2015 [Internet]. 2015. Available from: https://www.legislation.gov.uk/anaw/2015/2/contents
36. Welsh Government. Health and Well-being [Internet]. 2020 [cited 2020 Oct 22].
37. Welsh Government. Pedagogy - Hwb [Internet]. 2023 [cited 2024 Mar 5].
38. Peralta LR, Rowling L. Implementation of school health literacy in Australia: A systematic review. https://doi.org/101177/0017896917746431 [Internet]. 2017 Dec 21 [cited 2024 Mar 5];77(3):363–76. DOI: 10.1177/0017896917746431.
39. Leksy K, Gawron G, Rosário R, Sormunen M, Velasco V, Sandmeier A, et al. The importance of school leaders in school health promotion. A European call for systematic integration of health in professional development. Front Public Health. 2023 Jan 4;11:1297970. DOI: 10.3389/fpubh.2023.1297970/bibtex.
40. Smith C, Goss HR, Issartel J, Belton S. Health Literacy in Schools? A Systematic Review of Health-Related Interventions Aimed at Disadvantaged Adolescents. Children 2021, Vol 8, Page 176 [Internet]. 2021 Feb 25 [cited 2024 Mar 5];8(3):176. DOI: 10.3390/children8030176.
41. Viner RM, Ozer EM, Denny S, Marmot M, Resnick M, Fatusi A, et al. Adolescence and the social determinants of health. The Lancet [Internet]. 2012 Apr 28 [cited 2024 Mar 5];379(9826):1641–52. DOI: 10.1016/s0140-6736(12)60149-4.

42. Nash R, Patterson K, Flittner A, Elmer S, Osborne R. School-Based Health Literacy Programs for Children (2-16 Years): An International Review. J Sch Health [Internet]. 2021 Aug 1 [cited 2024 Mar 5];91(8):632–49. DOI: 10.1111/josh.13054.
43. Jenkins CL, Sykes S, Wills J. The conceptualization and development of critical health literacy in children: a scoping review. Health Promot Int [Internet]. 2023 Oct 1 [cited 2024 Mar 5];38(5). DOI: 10.1093/heapro/daad116.
44. Sykes S, Wills J. Critical health literacy for the marginalised: Empirical findings. In: Okan O, Bauer U, Levin-Zamir D, Pinheiro P, Sørensen K, editors. International Handbook of Health Literacy: Research, practice and policy across the lifespan. Bristol: Policy Press; 2019.
45. Mantwill S, Diviani N. Health literacy and health disparities: A global perspective. International Handbook of Health Literacy. 2022 May 6;139–52. DOI: 10.51952/9781447344520.ch009.
46. Jensen BB. Environmental and health education viewed from an action-oriented perspective: a case from Denmark. Journal of Curriculum Studies [Internet]. 2004 [cited 2024 Mar 5];36(4):405–25. DOI: 10.1080/0022027032000167235.
47. Australian Curriculum. Structure: The Australian Curriculum (Version 8.4) [Internet]. Australian Curriculum, Assessment and Reporting Authority. [cited 2024 Mar 5].
48. Alfrey L, Brown TD. Health literacy and the Australian Curriculum for Health and Physical Education: a marriage of convenience or a process of empowerment? Asia-Pacific Journal of Health, Sport and Physical Education [Internet]. 2013 [cited 2024 Mar 5];4(2):159–73. DOI: 10.1080/18377122.2013.805480.
49. Dadaczynski K, Sykes S, Bíró É, Kósa K. Editorial: The Social-Ecological Context of Health Literacy. Front Public Health [Internet]. 2022 Apr 26 [cited 2024 Mar 6];10:897717. DOI: 10.3389/fpubh.2022.897717.
50. Lambert K, Penney D. Curriculum interpretation and policy enactment in health and physical education: researching teacher educators as policy actors. Sport Educ Soc [Internet]. 2020 May 3 [cited 2024 Mar 5];25(4):378–94. DOI: 10.1080/13573322.2019.1613636.
51. Paakkari O, Paakkari L. Health literacy and the school curriculum: The example of Finland. In: Okan O, Bauer U, Levin-Zamir D, Pinheiro P, Sørensen K, editors. International Handbook of Health Literacy: Research, practice and policy across the lifespan [Internet]. Bristol: Policy Press; 2019.
52. Swansea University. Primary with QTS, PGCert - Swansea University [Internet]. [cited 2024 Mar 5].
53. Welsh Government. Initial Teacher Education (ITE) [Internet]. 2023 [cited 2024 Mar 5].
54. Welsh Government. Schools' census results: January 2023 [Internet]. Statistics and Research. 2023 [cited 2024 Mar 5].
55. Okan O, Lopes E, Bollweg TM, Bröder J, Messer M, Bruland D, et al. Generic health literacy measurement instruments for children and adolescents: A systematic review of the literature. BMC Public Health [Internet]. 2018 Jan 22 [cited 2024 Mar 5];18(1):1–19. DOI: 10.1186/s12889-018-5054-0/figures/2.

56. Guo S, Armstrong R, Waters E, Sathish T, Alif SM, Browne GR, et al. Quality of health literacy instruments used in children and adolescents: a systematic review. BMJ Open [Internet]. 2018 Jun 1 [cited 2024 Mar 5];8(6). DOI: 10.1136/bmjopen-2017-020080.
57. Paakkari O, Torppa M, Kannas L, Paakkari L. Subjective health literacy: Development of a brief instrument for school-aged children. https://doi.org/101177/1403494816669639 [Internet]. 2016 Sep 21 [cited 2023 Apr 28];44(8):751–7. DOI: 10.1177/1403494816669639.
58. Bollweg TM, Okan O, Freţian AM, Bröder J, Domanska OM, Jordan S, et al. Adapting the European Health Literacy Survey Questionnaire for Fourth-Grade Students in Germany: Validation and Psychometric Analysis. Health Lit Res Pract. 2020 Jul 16;4(3):e144–59. DOI: 10.3928/24748307-20200428-01.
59. Abel T, Hofmann K, Ackermann S, Bucher S, Sakarya S. Health literacy among young adults: a short survey tool for public health and health promotion research. Health Promot Int [Internet]. 2014 Jan 30 [cited 2024 Mar 5];30(3):725–35. DOI: 10.1093/heapro/dat096.
60. Paakkari O, Kulmala M, Lyyra N, Torppa M, Mazur J, Boberova Z, et al. The development and cross-national validation of the short health literacy for school-aged children (HLSAC-5) instrument. Sci Rep. 2023 Oct 31;13(1):18769. DOI: 10.1038/s41598-023-45606-1.
61. Marchant E. HAPPEN: The Health and Attainment of Pupils in a Primary Education Network [Internet]. [Swansea]: Swansea University; 2020 [cited 2021 Mar 22].
62. HAPPEN Wales. HAPPEN - Network [Internet]. 2023 [cited 2023 Aug 18].
63. Einhorn J, James M, Kennedy N, Marchant E, Brophy S. Changes in self-reported health and wellbeing outcomes in 36,951 primary school children from 2014 to 2022 in Wales: an analysis using annual survey data. Front Public Health [Internet]. 2024 Feb 14 [cited 2024 Mar 6];12. DOI: 10.3389/fpubh.2024.1285687/full.
64. Bollweg T, Okan O. Measuring children's health literacy: Current approaches and challenges. In: Okan O, Bauer U, Levin-Zamir D, Pinheiro P, Sørensen K, editors. International Handbook of Health Literacy: Research, Practice and Policy across the Life-Span [Internet]. Bristol: Policy Press; 2019. p. 83–97.
65. Welsh Government. Community Focused Schools [Internet]. 2022 [cited 2024 Mar 5].