

Camau i'r Dyfodol

Curriculum for Wales: Evolving understandings of progression in learning

Phase 1 report: February 2023



Authorship

Principal Researchers

David Morrison-Love (University of Glasgow)

Sonny Singh (University of Wales Trinity Saint David)

Kara Makara-Fuller (University of Glasgow)

Research Team

Gareth Evans (University of Wales Trinity Saint David)

Jennifer Farrar (University of Glasgow)

Fiona Patrick (University of Glasgow)

Nanna Ryder (University of Wales Trinity Saint David)

Estelia Borquez-Sanchez (University of Glasgow)

Elaine Sharpling (University of Wales Trinity Saint David)

Francisco Valdera-Gil (University of Glasgow)

Lesley Wiseman-Orr (University of Glasgow)

Audience and style

Audience Welsh Government, education system professionals in Wales.

Style It is anticipated that most readers will access this document on screen (either online or via laptop or PC). It is therefore presented using 12-point Calibri font for clarity on screen, particularly when enlarged using the zoom function.

Contents

Authorship	2	3 Phase 1 research design	12
Principal Researchers	2	3.1 Phase 1 aims and research questions	12
Research Team	2	3.2 Research activities	12
		Literature review (curriculum, assessment, pedagogy, and progression)	12
Audience and style	2	Understanding co-construction	12
		National Network Conversations	12
Executive summary	5	Discussion groups	13
Background	5	3.3 Analytic approach	13
Research aims and methods	5	3.4 Phase 1 ethics	13
Key findings	5	3.5 Phase 1 data management	13
Implications for the system	6		
Implications for the project	6	4 Literature review	15
List of abbreviations	7	4.1 A note about terms and progression models	15
		4.2 Methods	17
Terms used in the report	7	4.3 Findings	17
		What relationships, if any, are discussed in literature between curriculum, assessment, pedagogy, and progression?	17
1 Introduction	8	Are there examples of effective practice among teachers enacting curriculum, assessment, and pedagogy in relation to evaluating/assessing progression?	20
1.1 Ways of working in the project	8	Is there evidence that any relationship between curriculum, assessment, pedagogy, and progression has an impact or influence on learning? If so, what might the impact or influence be?	21
1.2 How do we use the term 'progression' in the report?	8		
1.3 Report structure	9	4.4 Discussion	21
		4.5 Findings in brief	22
2 Research context	10		
2.1 The evolution of Curriculum for Wales	10		
2.2 Curriculum vision	10		
2.3 What this means for <i>Camau i'r Dyfodol</i>	11		

5 Approaches to co-construction	23
5.1 Methods	23
5.2 Context	23
Curriculum reform and the emergence of co-construction	23
What is co-construction and what supports it?	24
Linking to the project's work in Wales	25
5.3 Discussion	26
5.4 Findings in brief	26
6 National Network Conversations	28
6.1 Methods	28
6.2 Findings	28
Theme 1: Creating a shared understanding of progression	28
Theme 2: Understanding assessment	30
Theme 3: Culture change	31
6.3 Discussion	32
6.4 Findings in brief	33
7 Discussion groups	34
7.1 Methods	34
7.2 Findings	35
Theme 1: Translating progression from policy to reality	35
Theme 2: Moving from assessment to assessing	37
Theme 3: The importance of collaboration	39
7.3 Discussion	40
7.4 Findings in brief	41

8 Summary of findings and implications	42
8.1 Answering the research questions	42
How can the relationships between curriculum, assessment and pedagogy be understood in relation to progression?	42
How can co-construction be conceptualised to support sustainable educational change and knowledge building in different professional contexts?	42
What influences are there, in different professional contexts, on current and future curriculum realisation?	42
How are educational partners moving their identified priorities forward for curriculum realisation?	42
8.2 Implications	43
Implications for the system	43
Implications for the project	43
8.3 In conclusion	44
9 References	45

Findings in brief

Literature review	22
Approaches to co-construction	27
National Network Conversations	33
Discussion groups	41

Executive summary

Background

Curriculum for Wales (CfW) is the product of a creative approach to policymaking involving key stakeholders in the education system in a ground-up approach to curriculum design. Ways of working to create the curriculum centre on processes of co-construction involving education professionals from across the system. Concepts of progression in learning are core to the new curriculum and its vision for learning. The *Camau i'r Dyfodol* (Steps to the Future) research project has been designed to support education professionals in Wales to advance practical understandings of progression in learning. It is a 3-year project involving four phases of research. This report focuses on the research activities for Phase 1 (1st March-31st August 2022).

Research aims and methods

Phase 1 of the project aimed to understand where education professionals are in the change process and what professional contexts for change might support co-construction activity within and beyond the project. Phase 1 also aimed to develop the project's conceptual and theoretical grounding in relation to i) co-construction and ii) the relationships between curriculum, assessment, pedagogy, and progression. Finally, it aimed to work with participants to build trust in the process of co-construction as a way of working within *Camau i'r Dyfodol* going forward to the next phases.

Phase 1 used a qualitative interpretivist research design, including:

- A literature review to explore what is known about progression in learning from international published research.
- A review of literature and theory on co-construction.
- Thematic analysis of National Network Conversation (NNC) data involving education professionals in Wales. The focus for this NNC was *assessment and progression*.
- Thematic analysis of data from discussion group conversations involving education professionals in Wales.
- Teachers are positive about the idea of embracing co-construction principles. However, they indicated challenges that have an impact on their co-construction activities. These challenges included time, time challenge, lack of collaborative work between primary and secondary schools in some clusters, and capacity building within the system.
- Some participants find the content on Hwb useful as a resource for curriculum documents and sources of support that they can access and re-access. However, others find the volume of information too great, and feel that specific exemplars to support curriculum realisation would be helpful. The language, volume and perceived vagueness of the curriculum documents were seen as barriers to understanding.

Key findings

- The findings suggest a desire across the system to create a shared and consistent understanding of progression in learning. Practitioners are trying to create meaningful ways of assessing progression using approaches that are authentic, formative, and embedded in day-to-day learning. Schools and clusters are thinking carefully about how to put learners at the centre of the assessment process.
- Understanding of progression is being co-constructed by teachers and school leaders within and between schools with support from middle-tier partners. However, unpacking the language of the *Principles of Progression* and 'translating' these to school settings is time-consuming. Some participants are concerned that local curriculum developments will diverge, creating different understandings of progression and assessment across Wales.
- Progression as it is understood in Curriculum for Wales seems to be a broader concept than the learning progressions (LPs) which are the focus of most of the research literature. In that literature, LPs are models of learning that relate to domain-specific aspects of subjects/disciplines in which they offer descriptions of possible pathways for learning knowledge, understanding, skills, and concepts. It is unclear the extent to which progression as it is understood in the literature would be valuable within CfW. Highly domain-specific models of progression may be at odds with the curriculum if it is adopting a learner-centred and integrative approach to curriculum design and realisation. To understand this more fully, it would be helpful to know which model of curriculum design CfW aligns with or draws from.

- Participants understand the scale of the challenge in changing assessment culture from one that is accountability-driven to one that is learner-focused. There were several common sources of anxiety about the process. There were concerns about the forms of evidence Estyn will look for and some were concerned that a 'tracking' of progress over time would be needed. There was a tendency to fall back on commercial tracking solutions for that purpose. Many participants were also concerned about how they would communicate progression effectively not only to Estyn but to learners, parents, and colleagues. Concern was also expressed that there could be washback effects of new national examinations at secondary level which could undo much of the work that was currently being done.

Implications for the system

- There seem to be tensions between autonomy for practitioners as curriculum-makers to create curricula locally, and consistency of understanding of the new curriculum across the system. It would help to clarify how much tolerance there is for differences in approaches to translating CfW into practice across the system and for different ways of understanding CfW.
- Subsidiarity around learning progression must be supported in a way that still ensures equity of learning experiences for learners across Wales. Keeping the broader curriculum purposes and directions in mind seems important for local and national coherence. To support a coherent approach to progression in learning, and to ensure alignment of curriculum, pedagogy and assessment, education partners need to be clear about the underlying curriculum model on

which CfW is based, or with which it aligns.

- Further clarity is needed in use of language around progression and assessment of progression as there are some inconsistencies across research, policy documents, resources on Hwb, and educational professionals regarding terms used. Teachers want to know what progression looks like. They would find specific exemplars helpful.
- Progression as used in CfW is a broad concept and does not seem to align with the more specific understanding of learning progression(s) (LPs) as described in the literature. Given their domain-specific nature, it is uncertain how useful a concept LPs are for use within CfW given the more integrated nature of the Areas of Learning and Experience. Clarification of the role of disciplines in CfW would help to understand this more fully.
- The form and role of accountability in relation to different approaches across the system and ways of understanding CfW is critical. The requirements of Estyn should be aligned with CfW's vision, aspirations and expectations of teachers and schools. It would help to provide more certainty in the system if an aligned approach to inspections was communicated as widely, as early and as clearly as possible.
- The washback effects of upper secondary examinations if they are not fully aligned with CfW represent a significant risk for curriculum realisation. The system needs to strive for vertical alignment of assessment approaches. If this is not achieved, tensions may arise for teachers in satisfying the needs of a national assessment system that is not aligned with formative and (teacher-designed) summative assessments that are focused on progression in learning.

- The process of co-construction is challenging, and it will be important for Welsh Government to convey their confidence in the process and try to foster a culture of openness to change at all levels. To support this, it would be helpful to have further clarity regarding expectations for how CfW might evolve in response to suggestions that emerge from ongoing development and co-construction activities across Wales.

Implications for the project

- Work is needed to conceptualise and better understand the interrelationship(s) between curriculum, assessment, and pedagogy in relation to progression as it is understood in CfW.
- Co-construction in *Camau i'r Dyfodol* will be thought of as a *learning activity*, with close attention paid to the intellectual and physical space that will support this learning activity to happen. Some of the challenges of co-construction may be offset through preparatory work, for example around the power of discussion, the need for time, and the reconsideration of roles.
- Given that co-construction is an iterative process, groups will need to decide where one topic ends and where another one begins, even though definitive answers may not have been reached and contested ideas may still be being played out. Co-construction activities need to consider knowledge *creation* rather than only knowledge *exchange*. Consideration also needs to be given to how new knowledge could be fed back into the system meaningfully.

List of abbreviations

AoLE	Area of Learning and Experience
CfW	Curriculum for Wales
HEI	Higher Education Institution
LP	Learning progression
NNC	National Network Conversation
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
STEM	Science, technology, engineering, and mathematics
UoG	University of Glasgow
UWTSD	University of Wales Trinity Saint David
WG	Welsh Government

Terms used in the report

Education partners	All those involved in realising CfW including policy makers, teaching and other education professionals.
Partner primary schools	A group of primary schools whose learners usually progress to a single secondary school.
Tier	The Welsh education system is structured over three 'tiers': the Welsh Government occupy Tier 1, regional consortia, local authorities, Estyn, Qualifications Wales and HEIs occupy Tier 2 (referred to as 'middle tier'), and schools and settings occupy Tier 3.
The Four Purposes	The four purposes of Curriculum for Wales are the shared vision for every child central to the curriculum and processes of learning. https://hwb.gov.wales/curriculum-for-wales/designing-your-curriculum/developing-a-vision-for-curriculum-design/#curriculum-design-and-the-four-purposes
Principles of Progression	Five principles of progression underpin progression in CfW's Areas of Learning and Experience. https://hwb.gov.wales/curriculum-for-wales/designing-your-curriculum/principles-for-designing-your-curriculum/#principles-of-progression
Progression Code	The Progression Code sets out mandatory requirements for school curricula with respect to progression. https://www.gov.wales/curriculum-wales-progression-code
Hwb	The Welsh Government's online repository to support teaching and learning in Wales https://hwb.gov.wales/

1 Introduction

Curriculum for Wales (CfW) is the product of a creative approach to policymaking involving key stakeholders from a range of organisations. Teachers, academics, policymakers, and support agencies have been included in the curriculum reform process, and distinctive voices have been heard. But the new curriculum is much greater than the sum of its parts, and there is appreciation that this transformation will have a profound effect on the nation it serves.

Camau i'r Dyfodol (Steps to the Future) is a 3-year joint research project designed to support education professionals in Wales to advance practical understandings of progression in learning, something which is central to the vision of CfW. The project contributes to the CfW change process by working with education professionals from across the system in Wales to consider how curriculum change can be facilitated sustainably going forward. What we learn will also contribute to national and international understandings of progression in learning and educational change. The *Camau i'r Dyfodol* team involves researchers from University of Wales Trinity Saint David and the University of Glasgow working in collaboration with Welsh Government.

The research project has four phases: Phase 1 is an exploration of current understandings of progression in the system and how these are being translated into practice. Phases 2 and 3 will involve working with education professionals to take forward areas relating to progression that they identify as priorities for practice. Phase 4 will focus on working with participants from across the system to identify what is needed to continue to build capacity among school professionals to sustain curriculum change beyond the life of the project. What is learned from each phase will be fed back into the Welsh education system as part of ongoing change processes and will also contribute to national and international understandings of progression and curriculum change.

This report is the result of Phase 1 of the project (1st March-31st August 2022). It is intended for the Welsh Government, who are funding the research, as well as education system participants involved in translating the new Curriculum for Wales (CfW) from policy into practice. It may also be of interest to the research and policy communities more widely.

1.1 Ways of working in the project

The *Camau i'r Dyfodol* project is based on the principle that change led by those at the heart of an education system provides the best opportunity for sharing expertise, building professional confidence, and fostering a coherent approach to CfW across

the system. To this end, the project team is working with a range of education professionals – teachers, middle-tier professionals¹, Estyn, Qualifications Wales, and education policy makers – to advance practical understandings of progression as the system moves to create sustainable changes to curriculum and practice. In the report we refer to this group as ‘education partners’ in the project and in the system working towards realisation of CfW.

The rationale for the project is therefore to work with practitioners to bring together complementary knowledges and experiences of education practice, theory, and research to support understanding of progression and what it means for learners as they progress through their school careers. It will also facilitate thinking about i) what the changes mean for participants as they adapt their professional roles to the changes, and ii) what the changes mean for the system in terms of new ways of thinking about accountability and professional practice.

1.2 How do we use the term ‘progression’ in the report?

The Curriculum for Wales [Progression Code](#)² states that:

1 Wales has developed a three-tier model for education policy development. Tier 1 is the Welsh Government. Tier 2 is the four regional consortia, local authorities, diocesan authorities, Estyn, Qualifications Wales, Education Workforce Council, examination boards and higher education. Tier 3 is schools.

2 The Code is a mandatory requirement ‘of what progression must look like for learners’ (p.6). Several elements of the curriculum framework exist to support progression: The Progression Code, the Principles of Progression, the What Matters statements, and the Descriptors of Learning. The code explains that the Principles of Progression are distinct from the Descriptions of Learning in the curriculum: the Descriptions of Learning are designed to provide ‘reference points’ for ‘what progression looks like’ as learners ‘work towards the statements of what matters’ (p.6).

Progression in learning is a process of developing and improving in skills and knowledge over time. This focuses on understanding what it means to make progress in a given area or discipline and how learners should deepen and broaden their knowledge and understanding, skills and capacities, and attributes and dispositions. This is key to them embodying the four purposes and to progressing into different pathways beyond school. (Welsh Government, 2021, p.5)

Five Principles of Progression are core to CfW: increasing effectiveness, increasing breadth and depth of knowledge, deepening understanding of the ideas and disciplines within the areas, refinement and growing sophistication in the use and application of skills, and making connections and transferring learning into new contexts (Welsh Government, 2021, pp.6-7). These principles are designed to underpin progression across six Areas of Learning and Experience (AoLEs). The Code also makes clear that ‘the principles of progression provide a mandatory requirement of what progression must look like for learners’ (Welsh Government, 2021, p.6).

The *Progression Code*, [curriculum guidance documentation](#), and the [CfW Framework](#) use various terms when discussing progression: progression in learning; appropriate progression; learning progression; learner progression; progression steps; progression of learning; progression in an area (i.e. a specific area of learning and experience – or AOLE). Most frequently, the documentation uses the term ‘progression’. For the sake of simplicity and consistency this is the term that will be used in this report, except where we are discussing the literature on progression, which most frequently uses the term *learning progression(s)*³. When we use the term

progression we are talking about progression as it is used by participants and as it is used in Curriculum for Wales, and as shorthand for progression in *learning*.

1.3 Report structure

The report is structured around the findings from the four research activities that took place during Phase 1 of *Camau i'r Dyfodol*. The structure is as follows:

- Section 2 outlines the context for the research in terms of the design and implementation of Curriculum for Wales.
- Section 3 explains the research design for the project. This includes the aims, research questions, research activities, analytic approach, ethics, and data management.
- Section 4 discusses what the research literature reveals about any relationships between progression and curriculum, assessment, and pedagogy.
- Section 5 focuses on how published literature understands co-construction and how this will inform ways of working with participants in future phases of the research.
- Section 6 presents findings from the National Network Conversations (NNCs) held in May 2022.
- Section 7 presents findings from a series of discussion groups held between the 4th and 22nd of July involving school professionals, regional consortia, local authorities, and Estyn.
- Section 8 presents a high-level overview of the findings together with the possible implications for the education system and for future phases of the project.

Sections 4-7 contain detail of the methods and findings, together with a discussion of these findings which relates them to international literature. However, at the end of each section there is a *Findings in brief* sub-section for ease of access.

3 We discuss this term more fully in Section 4.

2 Research context

This section provides the context for the *Camau i'r Dyfodol* project. It explains the development of CfW to highlight the key elements that influenced the project's design. It also provides an overview of the curriculum for those who may be unfamiliar with it.

As noted above, *Curriculum for Wales* (CfW) is the product of a ground-up approach to policymaking involving key stakeholders from a range of organisations. Co-construction has been central to the process of creating the new curriculum. The OECD report *Achieving the New Curriculum for Wales* highlights that this use of co-construction 'reflects an international trend towards open government' as well as a trend towards a more responsive approach to restoring trust in public institutions (2020, p.69).

2.1 The evolution of Curriculum for Wales

The 2010 PISA results indicated that learner performance in Wales was below that in the rest of the UK (United Kingdom) nations and on a downward trend. Describing the results as 'wake-up call to a complacent system' (Dauncey, 2016), the then Education Minister Leighton Andrews embarked on reforms that introduced national testing in reading and numeracy, and launched the National School Categorisation System that ranked every primary and secondary school in Wales using a traffic light system. The national tests and school categorisation were not universally welcomed.

In 2014, a new Education Minister Huw Lewis published *Qualified for Life* (Welsh Government, 2014), which outlined a five-year plan to develop (p.5):

- an excellent professional workforce with a strong focus on pedagogy;
- an engaging and attractive curriculum;
- credible and internationally respected qualifications;
- self-improving systems involving leaders of education at all levels to raise standards.

Perhaps the most significant outcome of *Qualified for Life* (Welsh Government, 2014) was the commissioning of a review of the national curriculum in Wales by Professor Graham Donaldson. This review resulted in the publication of *Successful Futures* (Donaldson, 2015).

Successful Futures listed 68 recommendations for the Welsh Government to consider including the change principle of subsidiarity. Recommendation 62 states that change should apply the principle of subsidiarity by 'encouraging local ownership and responsibility within a clear national framework of expectation and support' (Donaldson, 2015, p.99). As a way of working, subsidiarity is dependent on mutual trust and confidence that allows for the support and challenge called for in *Qualified for Life* (Welsh Government 2014) and empowers the teaching profession to be an active part in decision-making, rather than being simply recipients of policy. This empowerment recognises the unique value individuals bring to the decision-making process and, in the context of co-construction, ensures that all voices can be heard.

2.2 Curriculum vision

Although the new curriculum commenced in September 2022, it is understood that curriculum development in the context of CfW is an iterative and ongoing process. The Curriculum has been designed to provide a broad and balanced education from age 3-16, with mandatory [Statements of What Matters](#) setting out co-constructed broad statements of what matters in learning in each of the six AoLEs. Central to the new curriculum vision is a clear focus on progression, and what it means for children and young people to grow and flourish within the new curriculum arrangements.

Fundamentally, CfW requires a reconsideration of how learning happens and how learners progress in their learning. It also necessitates a review of established ways of working – a new vision for education in Wales demands that the system does things differently, provided there is an educational case to do so. How to recognise, support and enhance the aptitudes, capabilities, and talents of all learners, wherever in Wales and through whatever medium they study, is of primary concern here. In these considerations the four purposes are central: they are 'the starting point and aspiration for schools' curriculum design' (CfW, 2022, np). The four purposes are that every child will be 'supported to develop' as:

- 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 (CfW, 2021, np).

Another central principle of CfW is that assessment should be seen as 'an integral part of the learning process', supporting progression and putting learners 'at the heart' of assessment as 'active participants' (CfW, 2021, np).

2.3 What this means for *Camau i'r Dyfodol*

This project is intended to support a sustainable approach to change in the education system in Wales. As the OECD notes (2020, p.64), translating CfW from policy to practice 'means that teachers and school leaders are expected to become curriculum designers'. As already highlighted, co-construction is central to processes of curriculum making. As part of ongoing co-construction teachers have been working together in clusters and consortia and other networks to co-construct their understanding of progression and assessment.

Co-construction and equity of voice have been adopted as central to the design of the *Camau i'r Dyfodol* project, with a recognition that no single approach to the new ways of working can come from any one partner. The project has been created so that everyone is able to engage with the work of the project whether this is via local development in individual classrooms and schools, in educational organisations, through NNCs or directly as part of the project. Schools continue to face a range of demands following the pandemic and it is therefore critical to ensure that engagement with the project is meaningful, manageable, and valuable to people.

The *Camau i'r Dyfodol* project is based on the belief that change led by those at the heart of the system provides the best opportunity for sharing expertise, building confidence and coherence across the system, and supporting the realisation of CfW.

Camau i'r Dyfodol is working in the context of the *Renew and Reform Agenda* in Wales. As is the case in other countries, the Covid-19 pandemic has had a significant impact on Education in Wales. In practical terms, this has delayed the realisation of the new curriculum and the Welsh Minister for Education extended the timeline by a year to reflect this. To support the move out of the pandemic, the Welsh Government developed their ambitious *Renew and Reform Agenda* to support all pupils in Wales make the progress they need to continue their education and thrive. The agenda set out wide ranging commitments and funding to support this and learning progression sits at the heart of much of this. Specifically, the agenda states:

Focusing on progression is forward-looking, emphasising what learners need to make the next steps in their education. This avoids a deficit-based model focused on 'catching up' on everything that has been missed... Learners may face specific barriers to their development or may have lost specific opportunities important to their progression. Likewise, they may have not had access to a broad and balanced curriculum. It will be important to ensure we support their needs in the broadest sense to help them make that meaningful progression. (Welsh Government, 2021, np.)

The *Camau i'r Dyfodol* project was awarded its funding on the basis that it will play a key role in supporting understanding of progression within this context.

3 Phase 1 research design

This section⁴ outlines the aims, research questions and activities of Phase 1 of *Camau i'r Dyfodol*. It includes an overview of the approach to analysis, ethics, and data management.

3.1 Phase 1 aims and research questions

Phase 1 of the project had three aims:

- To understand where people are in the change process and what professional contexts for change might support co-construction activity within and beyond the project.
- To work with participants to build trust in the process of co-construction as a way of working within the *Camau i'r Dyfodol* project.
- To develop the project's conceptual and theoretical grounding in relation to co-construction and the relationships between curriculum, assessment, pedagogy, and progression.

To achieve these aims, we created the following research questions:

- How can the relationships between curriculum, assessment and pedagogy be understood in relation to progression⁵?
- How can co-construction be conceptualised to support sustainable educational change and knowledge building in different professional contexts?
- What influences are there, in different professional contexts, on current and future curriculum realisation?

3.2 Research activities

We designed the following research activities to explore the research questions:

Literature review (curriculum, assessment, pedagogy, and progression)

The review focused on understanding how progression is explained in literature and on understanding any relationships between curriculum, assessment, pedagogy, and progression so

that important findings could be shared with educational partners to support their understanding and their work in co-constructing approaches to developing a progression-based curriculum.

Understanding co-construction

Co-construction is central to the evolution and implementation of CfW. This activity was designed to conceptualise co-construction drawing on: a review of recent education reform in Wales; a review of research and theories on co-construction; conversations with a variety of educational partners. It was intended that clarity around what co-construction might mean could support collaborative knowledge-building within the *Camau i'r Dyfodol* project.

National Network Conversations

National Network Conversations (NNCs) were developed by the *Assessing for the Future* project⁶, Welsh Government and the *Camau i'r Dyfodol* project. These conversations are used to support teachers and other educational partners to reflect critically on practice in relation to progression and assessment and provide insights for both the *Camau i'r Dyfodol* project and the *Assessing for the Future* project. The NNC activity discussed in this report

4 This section is written in first person to indicate that, as researchers involved in qualitative research, we see ourselves as integral to the research process. This relates to what is known as researcher positionality in qualitative research. As Bourke (2014) says, qualitative research represents 'a shared space, shaped by both researcher and participants' (p.1). For example, research activities are not designed (e.g. *research activities were designed*): we as researchers design them. Findings do not emerge (e.g. *the following findings emerged from the data*): as researchers, we interpret data to produce findings. This does not mean that the research lacks rigour. It does, however, mean that ideas of quality and rigour must be relevant to qualitative research rather than 'measures' of validity, reliability, and generalisability (Mays & Pope, 2000, p.50) which are more relevant to non-qualitative approaches. See Section 3.3 for further discussion of quality as *trustworthiness*.

5 The inter-relationship between curriculum, assessment and pedagogy and the importance of alignment across these elements is explored in published literature. (See, for example: Hayes, 2003; Menter, 2016; Mills & McGregor, 2016; Wyse et al., 2016.) We wanted to explore whether any published research or theory explored a further relationship between these elements and progression.

6 *Assessing for the Future* was a joint project between University of Glasgow Educational Assessment Network (UGEAN) and of Yr Athrofa, University of Wales Trinity Saint David (UWTSD) that was commissioned by the Welsh Government to develop as assessment resource for use by practitioners, schools, and settings.

comes from 14 NNC conversations on assessment and progression held on one day in May 2022.

Discussion groups

We chose to call this activity *discussion groups* rather than *focus groups* to signal our intention that we wanted to reduce any sense of those who joined the groups being seen as the subjects of the research. It is difficult to create an equal power balance between researchers and participants, but we wanted to signal that, as far as possible, we were intending to create shared spaces for discussion. The groups were intended to:

- build trust and value in the research process through reflective discussion;
- gather information on where people are in their thinking about progression and assessment and what their priorities are moving forward;
- gather information on contextual factors influencing co-construction;
- provide a forum to discuss approaches to progression and assessment that participants had found valuable in their work so far.

We invited participants from across the education system to take part in the groups. Participants included:

- Teachers and school professionals at various stages in the process of curricular realisation and working in different ways within the system.
- Representatives from educational support partners (such as regional consortia, local authorities, HEIs and Estyn) and from Qualifications Wales who are working with teachers and school professionals to realise the new

curriculum and assessment arrangements.

3.3 Analytic approach

The qualitative interpretive approach we have taken for the data analysis uses methods that have acknowledged value and rigour. This approach involved a narrative literature review (Byrne, 2016; Rozas & Klein, 2010; Snyder, 2019), and thematic analysis to explore the National Network Conversation and discussion group data (see for example, Castleberry & Nolen, 2018; Clarke & Braun 2017; Fereday & Muir-Cochrane, 2006).

Throughout the research process, we have been guided by the quality concept of trustworthiness in the conduct of this research and in the analysis of the data. As Williams and Morrow (2009) state, researchers should justify that they have 'done due diligence' in terms of the research approach and reporting (p.576).

This due diligence involves establishing a rationale for the research, clearly describing the data collection procedures and analytic methods, and providing a clear interpretation of the data (Williams and Morrow, 2009, p. 576).

We gave the rationale for the research in Section 1.1. We outline the data collection approach in this section and in each chapter of the report as it applied to the research activity in that chapter. We followed Byrne's (2016) narrative approach to reviewing literature and the NNC conversation and the participant discussions in the discussion groups were analysed using Braun & Clarke's (2006) approach to thematic analysis. This is 'a method for identifying, analysing, and interpreting patterns of meaning ('themes') within qualitative data' (Clarke & Braun, 2017, p.297). To support the interpretation, we have foregrounded participant voices in the analysis of the NNC and discussion group data,

rather than providing higher level paraphrases and summaries which would leave more open to question how the data supported the interpretations made.

To further support trustworthiness, we have also been guided by the concept of methodological reflexivity (Olmos-Vega et al., 2023, p.245) – a process that involves consistent critical reflection and 'thoughtful consideration' of why certain methodological decisions have been made and what the implications of these could be for the participants, the analysis, and the reporting. At each stage of the research, this process involved lengthy and frequent discussions between the analysts and report writers in the research team and the principal investigators of *Camau i'r Dyfodol*.

3.4 Phase 1 ethics

Ethics approval for *Camau i'r Dyfodol* was granted by the ethics committees of UWTSB (Application Reference: EC974 PG2) and UoG (Application Reference: 400210149). Because of the co-constructive nature of the project, it was not possible to specify all research and data gathering activity at the start of the project. Instead, ethics amendments will be submitted for approval as the project progresses. All participants were provided with project information and time to reflect and ask questions to ensure that their choice to participate is fully informed. They are made aware that they are free to withdraw at any time without giving any reason, that data will be de-identified and that individuals will be referred to pseudonyms and/or general labels. Ethical approval for Phase 1 was granted in advance of data gathering activities.

3.5 Phase 1 data management

A central part of the project is the development of a data set that will be used to generate new knowledge in response to the project's research questions. The data

set will also inform successive phases of the project, support evaluation and reporting to Welsh Government, and feed knowledge back into the system to support sustainable change. The project's Data Management Plan specifies the protocols and approaches used to ensure the data set is fully compliant in relation to processing, storage, and sharing of data.

4 Literature review

We designed this review to extend that undertaken by the Camau project (Hayward et al., 2018), which informed initial understandings of progression and assessment to guide the development of progression frameworks in CfW. We will share the findings of the *Camau i'r Dyfodol* review with participants in the project during later phases of the research to support the co-construction of practical understandings of progression.

4.1 A note about terms and progression models

As Hayward et al. (2018) state, progression is ‘at the centre of the new curriculum in Wales. It structures, describes, and enables learning’ (p.17). They highlight that Donaldson’s use of the term in *Successful Futures* ‘represents a shift in discourse that aims to restructure the learning experience for pupils, from discrete and generalised stages of attainment to a learning continuum of individual achievement’ (Hayward et al., 2018, p.17). As noted earlier, CfW uses the terms *progression in learning*, *learning progression* and *progression* interchangeably in its mandatory framework. The research literature instead more

commonly uses the term ‘learning progressions’⁷ (LPs) which are domain-specific models of learning that characterise the changing nature of learner understanding from less to more sophisticated reasoning (Alonzo, 2018; Bonsall et al., 2020; Shea et al., 2013; Shepard, 2018; Sparks et al., 2021). In other words, LPs map predicted *possible* pathways of how learning might progress with respect to discipline-specific skills, knowledge and understanding (Harris et al., 2022; McDonald et al., 2019).

Stevens et al. (2009) have a helpful model of a hypothetical learning progression (see Figure 1 below) – although it should be noted that there is no single way to outline an LP, and the amount of detail in LPs varies. The model from Stevens et al. (2009) shows not just the element of progression but the process of development, refinement, and testing of the LP. This is a key point from the literature – LPs as they are understood in most of the literature are based on hypotheses of learning trajectories that teachers then observe in the classroom to evaluate the validity of their proposed LP.

Gallacher and Johnson (2019, p.11) note that LP models tend to have the following common characteristics:

1. They are ‘domain-content specific’ reflecting the ‘distinctive ways of thinking and distinct bodies of material that need

to be taught to be understood’ (p.11).

2. They are successive and progressive. If a learner does not master a ‘first thing, they are not able to do a second or third thing’ (p.11).
3. They are based on research about what learners can do ‘at different ages and stages of progression’ (p.11).

The literature is mainly concerned with the development of models of learning progressions that have been created by curriculum designers, teachers, and researchers, to describe learning within subject/disciplinary content knowledge and skills. Learning progression as described in this literature often relate explicitly or implicitly to a mastery⁸ approach to learning.

Progression is described in CfW as ‘a process of developing and improving in skills and knowledge over time’ in an area of learning or discipline, underpinned by its ‘Principles of Progression’. In addition, however, CfW notes that ‘learning progression not only reflects Area knowledge and understanding but also reflects the capabilities reflected in the four purposes, their [integral skills](#), and the [cross-curricular skills](#)’ (Welsh Government, 2020, np). This appears to reflect a broader concept of progression than that described in the research literature we selected for this review.

7 Few papers use the term *progression in learning*. Of those found, four were from the 1990s (Hughes 1996; Leach et al 1997; Kimbell 1994; Shirley et al. 1996). The research team deemed these to be too dated to include in the review and too specific to the National Curriculum in England at that time. Two are from the 2000s: Siraj-Blatchford (2008) discusses approaches to pedagogy in early years education; Hopkin & Owens (2015) briefly discuss progress in geography learning at Key Stages 2-4 of the National Curriculum in England. Neither was suitable for inclusion because of their specific context.

8 Mastery approaches to learning originated in the 1960s based on cognitive-behaviourist theories of learning. Perhaps the most famous model is Bloom’s Mastery Learning approach (Bloom, 1968). Slavin (1987) states that the defining characteristic of mastery approaches is ‘the establishment of a criterion level of performance held to represent “mastery” of a given skill or concept, frequent assessment of student progress toward the mastery criterion, and provision of corrective instruction to enable students who do not initially meet the mastery criterion to do so on later parallel assessments’ (p.175).

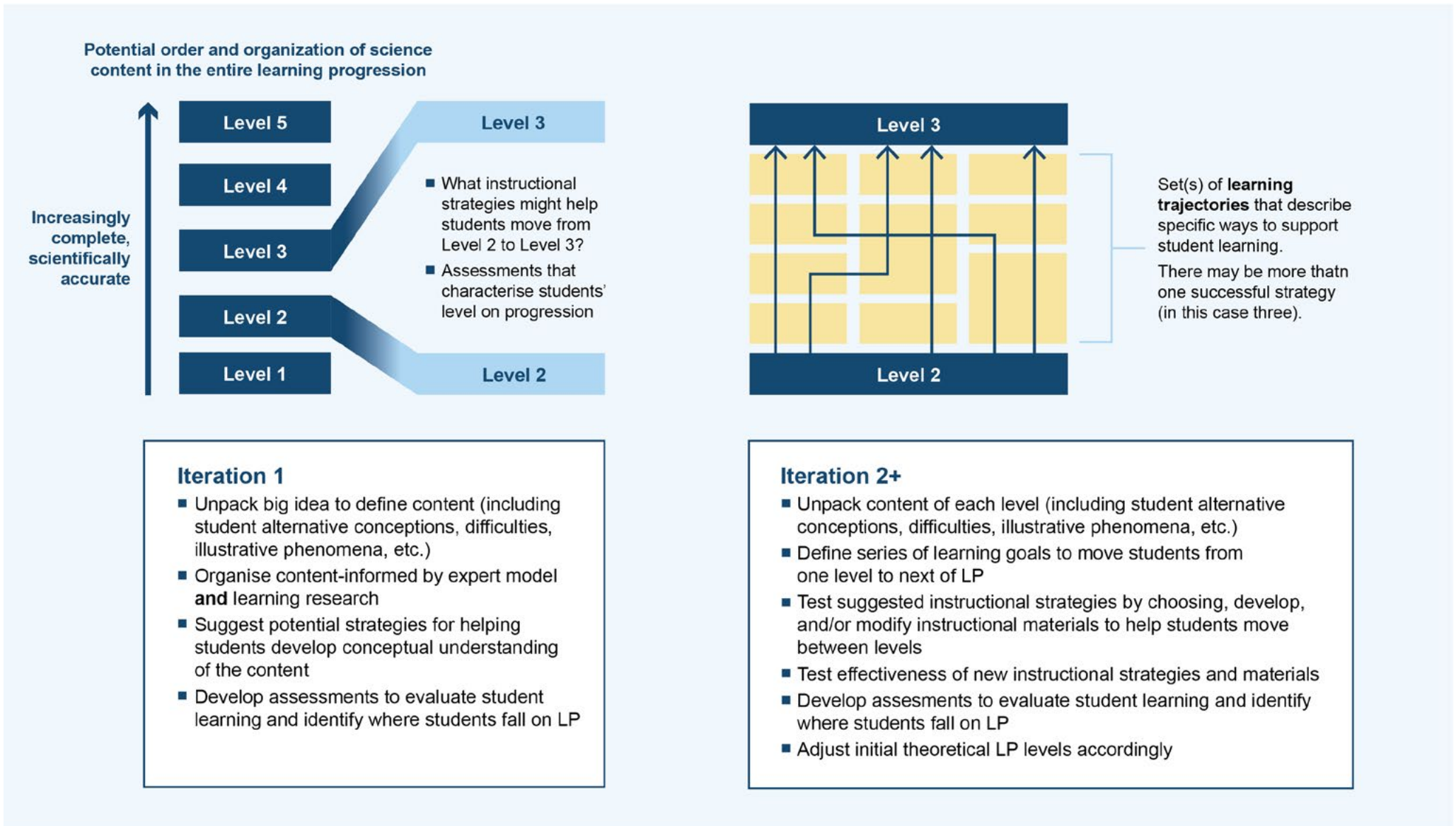


Figure 1: Stevens et al.'s (2009, p.4) hypothetical learning progression containing the stages of development, refinement, and empirical testing.

This literature tends to use the term 'learning progressions' to describe specific articulated descriptions of how learning changes in a specific disciplinary or subject domain, whereas CfW tends to refer to 'progression' to refer to processes of learning more broadly. For the remainder of this section, it may be helpful to bear in mind that we will use the term learning progressions (plural) and learning progression (singular) as these refer to the domain-specific models discussed in the research literature we reviewed.

4.2 Methods

The purpose of a narrative literature review is to synthesise existing knowledge on a particular area of interest to a research topic or question (see Green et al. 2006). This narrative literature review was focused on one of the research questions guiding Phase 1 of Camau i'r Dyfodol: *How can the relationships between curriculum, assessment and pedagogy be understood in relation to progression?* Three sub-questions were created to guide the review:

1. What relationships, if any, are discussed in literature between curriculum, assessment, pedagogy, and progression?
 - How are these relationships defined and/or understood? How are the relationships characterised (if at all)?
 - Are there differences in understanding across different participants in education (e.g. policy, teachers, parents, learners)?
 - What are the challenges in defining/enacting the relationship?
2. Are there examples of effective practice among teachers enacting curriculum,

assessment, and pedagogy in relation to evaluating/assessing progression?

- How do teachers evaluate/assess progression?
 - How do they communicate the results of this assessment to parents/carers and via formal reporting mechanisms?
3. Is there evidence that any relationship between curriculum, assessment, pedagogy, and progression has an impact or influence on learning? If so, what might the impact or influence be?

We derived search terms from these sub-questions and input them to the following databases: Taylor and Francis Online, SpringerLink, Emerald Insight, JSTOR and ERIC. Forty-one articles were deemed by the research team to be relevant to the sub-questions and so were included in the review. We created matrixes to summarise key concepts/findings from the articles and then created codes from the research questions to apply to the matrix content to synthesise findings across the literature. Most of the articles included (28) related to creating and using *learning progressions* in the sciences. The rest were as follows: two in STEM (science, technology, engineering, and mathematics), three in mathematics, two in geography, one in languages, and seven discussing LPs generally.

4.3 Findings

What relationships, if any, are discussed in literature between curriculum, assessment, pedagogy, and progression?

There is no discussion in the literature of progression as a generic developmental term or broad concept as it is used in Curriculum for Wales. However, there is some discussion of

curriculum, assessment, pedagogy and *learning progressions* as models of learning in particular domains although the inter-relationship between all four elements is not well defined or explored to any great extent in the literature that was found.

How are the relationships defined and understood? How are the relationships characterised (if at all)?

Learning progressions (LPs) are most frequently discussed as being important to creating *alignment* between curriculum, assessment, and pedagogy (Cardace et al., 2021; Duncan & Hmelo-Silver, 2009). Some studies also speak of LPs as being important for curriculum coherence (Fortus & Krajcik, 2012; Jin et al., 2019a; Fonger et al., 2018). There is also some reference to curriculum, assessment, pedagogies, and LPs being *interrelated* (Black et al., 2011; Cisterna & Gotwals, 2018; Jin et al., 2019a; Jin et al., 2019b; Duschl et al., 2011) but the literature is not always clear on the ways in which this interrelationship can be explained. Conceptual frameworks exist for LPs that include curriculum, assessment, and pedagogy (for example, Fonger et al., 2018). However, further research is needed to understand the relationships between all four elements.

LPs are variously described as 'templates' (Songer et al., 2009), organisational frames (Duschl et al., 2011), 'road maps' (Black et al., 2011), guides (Steedle & Shavelston, 2009) or 'cognitive models' (Corcoran et al. 2009) around which curriculum, assessment and pedagogy are designed and aligned. Papers from the United States tend to position this alignment in terms of instructional design, with each LP supporting the ordering, sequencing and structure of content and assessment, and informing choices about appropriate disciplinary pedagogies (Alonzo & Elby, 2019; Cardace et al., 2021; Duschl et al., 2011; Furtak et al., 2018; McDonald et al., 2019; Songer et al., 2009; Sparks et al., 2021). However, the literature often

claims this importance rather than evidencing it.

Black et al. (2011) and Engelhard Jr. and Sullivan (2011) come closest to a detailed exploration of the relationship, but again within the context of learning progressions rather than progression more generally. Black et al. (2011) look specifically at how the Berkeley Evaluation and Assessment Research Centre assessment system might support integration across curriculum, assessment, and pedagogy within LP design. The authors argue for the importance of assessment forming the backbone of understanding learning progression, based on dialogue arising from questioning and activities, written work as a basis for formative feedback, and classroom-based summative tests of understanding. Black et al. (2011) state that teachers need to have an idea of learning progression if they are to make sense of assessment information, and that this might come from evidence-based LPs. Importantly, assessment and pedagogy will be influenced by the nature of the curriculum and how it is interpreted at classroom, school, and national levels (p.79).

Engelhard Jr. and Sullivan (2011) state that LPs can provide a 'common underlying road map that has implications for curriculum expectations, for pedagogical practices for meeting those expectations, and for assessments' (p.138). They underline the importance of the relationships and activities that are central to the enactment of a curriculum-assessment-pedagogy 'triangle' (p.143). In relation to this, Engelhard Jr. and Sullivan argue that educational processes and outcomes 'can be meaningfully viewed as emergences where the whole is greater and qualitatively different from the sum of separate parts' (2011, p.143). They state that LPs might support teachers to think about these aspects of teaching and learning: what the affordances for learning might be in specific curriculum elements and any associated

pedagogies and assessments; how learners might be supported to be aware of these affordances; and how diversity and variability in learning might be embraced (Engelhard Jr. & Sullivan, 2011, p.143).

Overall, the review found that the most fully understood relationship was between LPs and assessment. This is perhaps unsurprising given that LPs originate in work on assessment systems designed to track learner progress (Duncan & Hmelo-Silver, 2009). LPs tend to be described as frameworks or scaffolds for formative and diagnostic assessment which can support teacher understanding of how learners are thinking about aspects of learning (Furtak et al., 2018; Pham et al., 2021). They can also inform instructional next steps for teachers and learners (Furtak, 2012; Shepard, 2018; Sparks et al., 2021). Some papers, however, tended to take a measurement approach with a strong emphasis on validity and reliability of assessment instruments (Pham et al., 2021; Sparks et al., 2021; Steedle & Shavelston, 2009; Wilson 2009). For example, Pham et al. (2021) state that the usefulness of LPs 'depends, in part, on the validity of the interpretations that are made based on the LP' (p.107).

The literature emphasises the importance of formative assessment to evaluate learner understanding (for example, Alonzo & Elby, 2019; Black et al., 2011; Cisterna & Gotwals, 2018; Duschl et al., 2011; Harris et al., 2022; Sparks et al., 2021). The importance of using formative assessment to interpret learner thinking and provide feedback to support learning was seen as a core element in LP design and enactment (Alonzo, 2018; Harris et al., 2022). There was also discussion of the importance of formative assessment practices being grounded in disciplinary rather than generic understandings of learning (Furtak et al., 2018; Harris et al., 2022; Sparks et al., 2021; Wilson, 2009). Most papers focused on teachers' use of assessment information: Harris et al. (2022) state that learner use

of LP information is 'largely unexplored' (p.23).

Assessment information was commonly used to refine and validate LPs (for example, Siemon, 2021; Bailey & Heritage, 2014), but LPs might also be used to inform assessment design for formative and summative purposes and/or moment-by-moment teacher feedback to learners during learning (Harris et al., 2022). Alonzo and Elby (2019) also argue that LPs can help teachers to 'notice' learning explicitly. Furtak et al. (2018) do, however, note that formative assessment tasks 'need to be carefully designed to draw out learner thinking, using various types of scaffolds to generate information that is both easily interpretable and instructionally actionable by teachers' (p.144). Other authors mention the challenges of creating reliable assessments given that learner thinking does not always correspond to the proposed developmental pathway set out in the LP (Wilson, 2009) and may not be assessed as relating to a specific single progression level (Harris et al., 2022; Steedle & Shavelston, 2009).

Are there differences in understanding across different participants in education (e.g. policy, teachers, parents, learners)?

There was little discussion of how curriculum, pedagogy, assessment, and LPs (as domain-specific models) are understood by different stakeholders or system participants. Of the articles that do touch on different understandings, Harris et al. (2022) note that teachers, researchers, assessors, and curriculum developers come to create LPs from diverse perspectives: ideas about what constitutes learning progression may vary across these perspectives. There were arguments for the potential to create shared understandings among participants in the process of developing LPs. For example, Wyner and Doherty (2017) argue that LPs can provide a basis for dialogue between education researchers

and curriculum and assessment developers and so support joint understanding. Others discuss LPs that have been designed and/or refined through dialogue between researchers and teachers (Huynh et al., 2015; Lehrer & Schauble, 2015; Morrell et al., 2017). Lehrer and Schauble (2015) see the potential for LPs to create ongoing opportunities for 'working together to build coherent accounts of learning' (p.436).

Some research outlines the types of support offered to teachers to enhance understanding about how to create and/or work with LPs. Support was found particularly helpful in terms of exploring how formative assessment might be designed and used to provide feedback and evidence relating to learning progression (Alonzo & Elby, 2019; Covitt et al., 2018; Furtak et al., 2018; Harris et al., 2022). Harris et al. (2022) also mention inputs to support teachers in sciences and mathematics to focus on developing learner reasoning via LPs rather than directly correcting errors and misconceptions.

There was also recognition that the needs of assessment at national and school levels can differ in that understanding of learning progression tends to be needed at a finer level of detail in schools than is required at national level where the results of large-scale examinations are generally preferred to evaluate learning and attainment (see Kobrin et al., 2015). As a result, there was acknowledgement of the importance of vertical alignment between LPs, classroom assessments and national/state assessment expectations (Duschl, 2019; Harris et al., 2022; Shepard, 2018). Where vertical alignment is not achieved, tensions can arise for teachers in satisfying the needs of a national assessment system alongside using LPs to inform more fine-grained formative and (teacher-designed) summative assessments (Cisterna & Gotwals, 2018; Shepard, 2018). However, Alonzo and Steedle (2008) argue that LPs provide a 'promising

framework' for developing both large- and small-scale assessments that are 'grounded in models of how understanding develops in a given domain' (p.390).

What are the challenges in defining/enacting the relationships?

One main challenge is that the relationship between curriculum, assessment, pedagogy, and LPs seems to be claimed rather than evidenced or fully explored across all four elements. Another challenge is that LPs can have different characteristics and there is a lack of consensus on how to develop them (Duschl et al., 2011). How thinking might develop in response to instruction is also outlined differently across LPs, with some outlining levels and others placing more emphasis on the messiness of the intermediary elements of the LP - the 'messy middle' (Harris et al. 2022; Sikorski 2019). Indeed, multiple messy middles might exist and need to be outlined as possible trajectories in an LP (Lombard et al., 2018). Care is usually taken to stress that LPs do not assume a linear or definitive pathway for learning but rather a hypothesis about how learning *might* develop (Alonzo & Elby, 2019; Duncan & Hmelo-Silver, 2009; Sparks et al., 2021). LPs should not be based on assumptions of 'one best progression or pathway' (Corcoran et al., 2009, p.8).

Most understandings of LPs were based on the idea of proposed levels of cognitive complexity outlined within upper and lower 'anchors' (Duncan & Hmelo-Silver, 2009; Duschl et al., 2011; Harris et al., 2022; Jin et al., 2019a; Shea & Duncan, 2013). Context-dependent anchors outline the starting points for thinking and learning and the 'upper reach' of ways of knowing about the concepts or skills being learned (Sikorski, 2019). However, some proposals for these anchors position them as 'bounding' progression (Duschl et al., 2011; Duschl, 2019; Shea & Duncan,

2013), which may create a sense of a 'specific end point' for learner development in terms of the learning (Schneider & Plasman, 2011, p.532).

Sikorski argues that the 'upper reach must acknowledge plurality in ways of thinking. In LPs with a fixed, singular upper anchor, that plurality is lost as one moves up through the levels of the progression toward the "most sophisticated" way of thinking.' (2019, p.974). There may be a challenge here in ensuring a flexible/plural approach to the concept of anchors.

There may also be challenges in the amount of time and involvement needed for ongoing review and refinement of LPs. For example, Fonger et al. (2018) argue that conjectures about possible LPs should be based not only on the concepts involved in a disciplinary area but on observations of how learners learn. Corcoran et al. (2009) go further in stressing that LPs are 'empirically grounded and testable hypotheses' about learning based on 'research about how students' learning actually progresses — as opposed to selecting sequences of topics and learning experiences based only on logical analysis of current disciplinary knowledge and on personal experiences in teaching' (p.8). LP pathways therefore require regular evaluation and refinement by teachers using classroom evidence of learning based on assessments over time (McDonald et al., 2019; Shepard, 2018; Sparks et al., 2021; Steedle & Shavelston, 2009; Wilson, 2009).

Alonzo and Elby (2019) and Jin et al. (2019a) suggest that LPs may not always fit well with how learners think about concepts in science or mathematics. Sparks et al. (2021) note that the possible progression(s) mapped in any LP are provisional and so 'will not apply equally well to all students and will be mediated by instruction' (p.216). Learners may display characteristics of learning at multiple levels, showing quite sophisticated thinking in some elements and less secure thinking in others (Harris et al., 2022). This can make it difficult to categorise

learner responses to specific progression levels (Harris et al., 2022). As Hammer and Sikorsky state, learner reasoning can be 'idiosyncratic' (2015, p.428).

Jin et al. (2019a) suggest that 'the effectiveness of an LP-based system of curriculum, instruction and pedagogy relies on teachers' understanding and use of the LP' and on teachers seeing themselves as enacting rather than delivering a curriculum (p.1211). Effective use of LPs is recognised as challenging for some teachers for the following reasons:

- Lack of content knowledge and pedagogic content knowledge (especially at the upper levels of a specific LP) (Alonzo & Elby, 2019; Harris et al., 2022; Jin et al., 2019a; Jin et al., 2019b).
- Difficulties in eliciting and interpreting learner *thinking* at different LP levels (Alonzo, 2018; Jin et al., 2019b).
- Difficulties in providing appropriate feedback and/or follow-up instruction (Siemon, 2021; Jin et al., 2019a).

Teachers may also tend to focus on whether learner responses are correct or incorrect, indicating that the learner 'gets it' or 'doesn't get it' (Alonzo & Elby, 2019; Covitt et al., 2018). As a result, they may correct learners directly rather than exploring why errors occur or unpacking what the errors indicate about thinking (Covitt et al., 2018; Harris et al., 2022). However, this set of findings comes from the literature on science LPs. Covitt et al. (2018) suggest that strongly didactic approaches to teaching science may influence this.

In addition, Harris et al. (2022) point out that perceived misalignment between LPs and existing curricula or external assessments can inhibit teachers' acceptance and use of LPs. However, they also highlight that LP-based assessment (along with professional development/collaborative working) can support

teachers to develop deeper content knowledge, pedagogical content knowledge, and knowledge of assessment design. This is especially true when teachers are involved in designing or evaluating LPs (Harris et al., 2022). Development of LP-based assessment depends on extensive dialogue and discussion and so is highly resource intensive and not easy to scale up effectively and efficiently (Harris et al., 2022; Jin et al., 2019a; Furtak et al., 2018; Bailey & Heritage, 2014). Shea and Duncan (2013) argue that the potential of LPs 'can only be realized' based on empirical findings that 'are revised in classroom contexts', but that doing this is 'challenging given the resulting messy, and context-dependent, nature of the data' (p. 24). There is also no commonly agreed way of validating LPs: processes vary in approach and rigour at classroom and system levels (Harris et al., 2022).

However, thinking about LPs has evolved in response to some of the challenges. For example, many LPs now incorporate broader considerations of learning rather than the stronger focus on conceptual development of earlier approaches. For example, there is interest in developing LPs in science to include development of 'habits of mind' and scientific ways of working (Tytler, 2018). There has also been reconsideration of anchors as possibilities rather than boundaries (Sikorski, 2019), increased acknowledgement of the need to think of multiple pathways for learning as possibilities (Sikorski, 2019) and the development of LP models that enable assessment of individual and collective learning in the 'messy middle' of the LP (Lombard et al., 2018). Progression does not occur along a smooth step-wise continuum – it may be characterised by unpredictable 'jumps' in learning and erratic conceptual progression (Lombard et al. 2018, p.105). It is now more recognised that learner thinking is context-dependent and influenced by the quality and type of instructional approaches (Fonger et al., 2018; Sparks et al., 2021). As a result, learner thinking may not conform

to specific LP levels at points when assessments take place (Alonzo & Elby, 2019, p.5). LPs therefore might best be seen as useful 'generative' 'launch pads' for teachers' thinking about learning rather than as models of how learning might take place (Alonzo & Elby, 2019) or as 'fixed linear pathways through which all students learn' (Pierson et al., 2017, p.1085).

Are there examples of effective practice among teachers enacting curriculum, assessment, and pedagogy in relation to evaluating/assessing progression?

The literature found for this review did not include explicit examples of effective practice. This does not mean that no effective practices exist, but discussion of teacher practices tended to centre on the aspects discussed below.

How do teachers evaluate/assess progression?

Alonzo and Elby (2019) highlight that the few examples of research exploring teachers' use of LPs for classroom decision-making tend to show that it is often inconsistent with the original concept of the LPs (p.8). Cisterna and Gotwals' (2018) study of four science teachers also highlights inconsistencies relating to how teachers used LPs to guide instruction and assessment. They found that the teachers 'were able to enact some components of formative assessment in a piecemeal fashion, but they tended to struggle with integrating formative assessment practices to enact seamless science instruction that was both rigorous and responsive to their students' ideas' (2018, p.2). Harris et al. (2022) also caution that LPs may encourage teachers to take a deficit view of assessment and learning and it may be more difficult in some disciplines to make meaning about progression from LP-based assessments than it is in others (p.19).

There is some discussion of the value of professional development to support teacher understanding of formative and summative assessment as these relate to LPs (Alonzo & Elby, 2019; Cisterna & Gotwals, 2018). The literature also explores the importance of 'grain size' (the number of levels and amount of detail in an LP) in assessing progression in learning (Harris et al., 2022; Shea & Duncan, 2013). Harris et al.'s (2022) systematic review of research suggests that too little detail in the LP can make it difficult for teachers to assess learning over time, but too much detail can become cumbersome (Harris et al. 2022). However, external assessments may not align with learning as described in LPs (Harris et al., 2022) and standardised tests are 'too insensitive' to assess complex thinking effectively (Songer et al., 2009, p.628). As Mohan & Plummer (2012) argue, no grain size will suit the needs of all stakeholders.

How do teachers communicate the results of assessment to parents/carers and via formal reporting mechanisms?

No research was found on the ways in which assessment information drawn from LPs is communicated to parents or other stakeholders. Harris et al.'s systematic review (2022) reported that no studies looked at how teachers documented LPs to parents via grades, reports, or other sources. Santelices and Wilson (2022) explore how teacher assessments and learning might be aligned through use of LPs and mention parents as important to the social contexts of learning. However, they do not mention forms of communication that would be helpful with parents/carers.

Is there evidence that any relationship between curriculum, assessment, pedagogy, and progression has an impact or influence on learning? If so, what might the impact or influence be?

There is little explicit discussion in the literature of any relationship between curriculum, assessment, pedagogy, and progression and so there is little information on what impact such a relationship might have on learning. There is some discussion of how using LPs to inform assessment and instructional design might have some impact on learning, but evidence is mixed (Harris et al. 2022; Jin et al. 2019a). Harris et al. (2022) suggest that LP-based formative assessments have the potential to inform teacher judgements about learning and so contribute to improved learner achievement. Corcoran et al. (2009, p.9) argue that LPs could do the following to improve learning: support shifts from didactic to adaptive instruction; inform curriculum design to ensure sufficient grounding in what learners need to progress in their learning; and provide clearer reference points to inform teacher thinking about any interventions learners may need to progress their understanding.

However, Jin et al. (2019b) highlight the need for more research to understand whether teachers' use of LP-associated assessments and teaching materials improves learner learning or not. Even where learning gains are seen, Harris et al. (2022) acknowledge that it is difficult to pinpoint the causes of any effects that LPs might have on learning and achievement (p.31). Engelhard Jr. & Sullivan (2011) also caution that emerging learning may not have 'clear gradual growth and may not even exist in any obvious cause and effect framework' (p.143). None of this is to say that LPs have no impact or influence on learning, but it is difficult to say what that impact or influence is from the research in this review.

4.4 Discussion

This literature review was conducted to contribute to answering the research question: *How can the*

relationships between curriculum, assessment and pedagogy be most helpfully understood in relation to progression? While relationships between all four components are not discussed in depth in the research literature, LPs are argued to contribute to curriculum, assessment, and pedagogic *alignment*. Sullanmaa et al. (2019) discuss the importance of alignment to creating a coherent curriculum in the context of curriculum reform in Finland. Curriculum coherence involves both the sense of direction and purpose of the curriculum and the synergy between approaches to instruction, goals of learning, and experiences of learning (Sullanmaa et al., 2019, p.247). Following from this, Sullanmaa et al. suggest three 'complementary components' to support coherence: consistency in the intended direction of the curriculum; an integrated approach to teaching and learning; and alignment between curriculum 'objectives', content, and assessments (2019, p.244). The literature on developing LPs tended to discuss alignment between the LP content, pedagogy, and assessment, but often discussions seemed divorced from the wider curriculum context, even within disciplinary areas. Keeping broader curriculum purposes and directions in mind seems important if cohesion is to be created locally and nationally. This matters because curriculum coherence can have a positive influence on pupil engagement and learning (Pietarinen et al., 2017, p.27).

The review findings also suggest that assessment practices can help teachers to gain insight into the nature of learner thinking, although it can be difficult to assess progress within single LP pathways when learners are at various stages of understanding. Aligning curriculum, pedagogy, and assessment may bring challenges for LP design, particularly in ensuring both horizontal and vertical alignment and in avoiding seeing learning as developing in a linear way along a continuum of progression. Two concepts seem valuable in working with LPs: the messy middle

and grain size. The messy middle represents an 'in-between' state where pupils may 'vary considerably' in their understanding of knowledge and concepts in an LP pathway (Briggs et al., 2017, p.13). Giving teachers time to explore these in-between states and consider their importance to progression could be important to supporting pupil learning (Briggs et al. 2017). Considering what grain size is most valuable in a LP is also important. Gotwals (2018) highlights that larger grain sizes are useful in considering progress over time while a smaller grain size 'provides nuances in the shifts in student thinking about specific content' and is 'more likely to support inferences that teachers could use to support student learning' (p.158).

Key messages relate to the benefits of creating multiple possible progressions pathways within each LP and not seeing the upper reach of any LP as being a boundary to further understanding. On these points, and more generally, it had been hoped that the review would find literature that gave examples of effective practices used by teachers in supporting progression for pupils, and in how they provided feedback on progression to learners and parents. However, no detailed descriptions of teachers' practices were found in the literature.

The literature did indicate that working with LPs may enhance teacher 'noticing' of learning, and identification of next steps, and might encourage teachers to develop adaptive expertise. Adaptive expertise is the ability to think and respond creatively and flexibly in complex, changing, or uncertain professional situations and contexts (Bowers et al., 2020). Given the insecure, 'messy and irregular' nature (De Arment et al., 2013, p.220) of emergent understanding, teachers' adaptive expertise would seem valuable for supporting pupil progression.

4.5 Findings in brief

- Progression as it is understood in Curriculum for Wales seems to be a broader concept than the learning progressions (LPs) which are the focus of most of the research literature in this area. In that literature, LPs are models of learning that relate specifically to aspects of particular domains in subjects/disciplinary areas in which they offer descriptions of possible pathways for learning specific knowledge, understanding, skills, and concepts.
- The research on LPs suggests that their development and use can contribute to curriculum, assessment, and pedagogic alignment. Therefore, they may contribute to curriculum coherence which can have a positive impact on engagement and learning (Pietarinen et al., 2017).
- Two concepts are valuable in working with LPs: the messy middle and grain size (the number of levels and amount of detail in an LP). The messy middle represents an 'in-between' state where pupils may vary in their understanding of knowledge and concepts in an LP pathway. Taking time to explore these in-between states could be important to supporting pupil learning (Briggs et al. 2017). Larger grain sizes are useful in considering progress over time while a smaller grain size 'provides nuances in the shifts in student thinking about specific content' and is 'more likely to support inferences that teachers could use to support student learning' (Gotwals, 2018, p.158).
- Research on LPs finds that progression does not occur along a smooth, step-wise

continuum. Learner thinking is context-dependent and influenced by the quality and type of instructional approaches (Fonger et al., 2018; Sparks et al., 2021).

- LPs are not meant to be viewed as linear pathways through which all children *will* progress, but as 'launch pads' for teachers' thinking about learning and the possible ways in which learning *might* progress in specific domains (Alonzo & Elby, 2019).

5 Approaches to co-construction

Curriculum for Wales states that schools should encourage ‘learners, parents, carers and the local community to understand and contribute to curriculum development’ (Welsh Government, *Designing your curriculum*, np). As part of this process, schools have been working to co-construct shared understandings of progression. However, co-construction is not clearly defined in CfW documentation. One of the important tasks for Phase 1 of the project was to develop a clear understanding of what co-construction is for the realisation of CfW, and for the *Camau i'r Dyfodol* project. This understanding will then inform the approach to working with participants in Phases 2 and 3 of the project. It could also contribute to thinking about co-construction in the wider system.

The research carried out for this element contributes to answering the research question:

- How can co-construction be conceptualised to support sustainable educational change and knowledge building in different professional contexts?

5.1 Methods

The literature on co-construction was explored to discover different approaches that might inform and

support the wider activities of *Camau i'r Dyfodol* during Phases 2 and 3. Core features of co-construction were sought to identify principles and guidelines for ways of working during the project. Key questions for the project to consider going forward were also devised. While these questions may also be relevant for stakeholders to consider, the purpose was to consider co-construction specifically in relation to the project’s design. Webster and Watson (2002) advise that considering what is known in literature creates a firm foundation for advancing knowledge and facilitates theory development: highly relevant to the project as it sought to theorise co-construction and develop guiding principles and key questions for its later phases.

5.2 Context

Curriculum reform and the emergence of co-construction

Curriculum and system reform in Wales involves shifting from high stakes accountability to a more decentralised approach that values teacher professionalism (Evans, 2022). The culture of performativity that characterises high-stakes accountability can be difficult to shift from, given that it rests on a long-standing culture of judgement and comparison (Ball, 2003) resting on national examinations and tests. Performative systems tend to expect teachers to abide by strict sets of conventions that if implemented are said to demonstrate and maintain educational quality in which teachers are viewed as technicians who deliver a curriculum rather than as professionals who foster learning (Orchard & Winch, 2015). CfW aims to move away from this type of approach towards one where schools and

practitioners are seen as best placed to make decisions about how to support learning (See CfW, 2022).

As we mentioned earlier, the 2014 plan *Qualified for Life* was an important document in signalling this shift. While there is no mention of the term ‘co-construction’ in the 2014 plan, some reference is given to expected ways of working: leaders in education would need to offer both ‘mutual support and challenge’ if standards were to be raised for all learners (Welsh Government 2014, p.21). The plan foregrounded collaborative and collective ways of working, with the potential for questioning or change made visible by using the word ‘challenge’. Following the publication of *Successful Futures* (Donaldson, 2015) and the acceptance of its recommendations, the principle of subsidiarity became key to curriculum development with those closest to practice creating curriculum at local levels. This was done initial through the ‘pioneer’ approach which brought teachers, universities, education experts and policy makers together to translate the recommendations from *Successful Futures* into reality. Co-construction was central to this process.

The report *So Far so Good: Building the Evidence Base to promote A Successful Future for the Curriculum for Wales* (Hayward et al., 2020) provides evidence that teachers involved in curriculum-building via the pioneer approach felt more empowered in the decision-making process. However, it was also recognised that the co-construction process can be messy and time consuming particularly when there is discussion over contested ideas which need to be reconciled, accommodated, or rejected. Hayward et al.’s (2020) report identifies some emerging principles and characteristics of co-construction that resonate with the literature, and which have been important to

thinking in this project and are discussed below.

What is co-construction and what supports it?

It is difficult to find clear definitions of co-construction in the literature and authors often use the term without explaining what is meant by it. Co-construction is often written about as a collaborative process, particularly in terms of:

- Learning and knowledge construction (Jarvis et al., 2016; Vuopala et al., 2019)
- Curriculum implementation and development (Nuttall, 2003).
- Research processes (Parsons, 2021; Schenkels & Jacobs, 2018).
- Policymaking (Wellstead et al., 2018).
- Workplace practices (Bouw et al., 2021).

Schenkels & Jacobs (2018) highlight the aim in participatory action research to ‘give voice’ to participants. This aligns with the ways of working in *Camau I'r Dyfodol* to encourage dialogue based on principles of equity where ‘justice is done to the inputs of all participants’ during processes of knowledge construction (Schenkels & Jacobs, 2018, p.701). Co-construction is often central to participatory action research, encouraging the involvement of a range of stakeholders, to respond to issues or challenges through co-construction processes (Arias & Kieffer, 2022, p.3).

Explaining co-construction

Where authors explain what they mean by co-construction, it tends to be described as a process of constructing knowledge based on collaborative practices that go beyond discussion to develop new insights and ways of working (see Parsons, 2021,

p.1493). Jarvis et al. (2016) state that co-construction occurs ‘in situations where a solution is achieved through collaboration and cooperation, where crucially no solution existed previously’ (p.408). Reaching solutions requires the creation and maintenance of ‘a joint problem space’ characterised by negotiation and cooperation (Reusser in Jarvis et al., 2016, p.408).

The work of Jacoby and Ochs (1995) and Engeström (2004; 2007) was also of interest to our thinking on the ways we might work with project participants. Jacoby and Ochs (1995) state that co-construction is found in, and emerges from, the ebb and flow of social interaction between participants in a discussion. They write that co-construction is:

the joint creation of a form, interpretation, stance, action, activity, identity, institution, skill, ideology, emotion, or other culturally meaningful reality. The co- prefix in co-construction is intended to cover a range of interactional processes, including collaboration, cooperation, and coordination. However, co-construction does not necessarily entail affiliative or supportive interactions. An argument, for example, in which the parties express disagreement, is nonetheless co-constructed (Jacoby & Ochs, 1995, p.171).

Interacting with others through processes of collaboration, co-operation and co-ordination can give participants the intellectual space needed to re-negotiate and reconstruct ideas. This can then lead to individual and/or collective shifts in thinking and the creation of a shared knowledge.

The importance of space and time to think

The need for a ‘thinking space’ such as that described by Jacoby & Ochs (1995) was discussed by teachers who participated in the early building of the Welsh curriculum (Hayward et al., 2020, p.46).

Participants noted the importance of creating a safe environment where accepted practice could be questioned, and individuals encouraged to see beyond their individual context to wider views (Hayward et al., 2020, p.46). Hicks (1996) argues that a space for co-construction should not be seen as a static environment but as an energetic and unique opportunity to discuss, shift thinking, and enable agreed meaning to emerge. This process takes time and, even once agreed meaning has emerged, it is always open to revision and so cannot be said to be stable or fixed (Hicks, 1996).

If co-construction processes require thinking spaces in which sometimes challenging issues can be discussed, and in which different and sometimes competing ideas can be encouraged with a view to reaching consensus, what might these spaces be like? How should they be understood? One way off thinking about this in an abstract sense is to use the concept of ‘liminal space’ which draws on theories of ‘liminality’: the state of being in transition, of being ‘in-between’ (Milligan, 2016).

Liminality was originally a concept from anthropology derived from Turner’s (1985) work to describe aspects of transition processes within cultural contexts, such as the transition from childhood to adulthood. Turner described liminality as being ‘betwixt and between’ two places or states (1985, p.31). Liminal processes and events offer opportunities for rethinking and transformation but can also create feelings of disorientation and anxiousness (Turner, 1985). Developing this idea in education theory, Conroy and de Ruyter (2009) discuss liminality as an intellectual space where previous thinking is ‘suspended or negated’ while new ideas are contemplated and reformulated. A liminal space can therefore be thought of in research as physical or intellectual space where transformations in learning and knowledge happen (Aharonian, 2021). Parsons (2021) writes

that knowledge co-construction in close-to-practice research is created by participants and researchers in a liminal space that is shared and synergistic.

Shifts in understanding: knots, knotworking, and boundary crossing

Engeström's (2007) work also recognises that shifts in understanding do not always come about through agreement but can involve a level of 'negotiation, exchange and trading' of ideas until a point of shared understanding is reached (p.24) and new knowledge and solutions are generated. In the context of organisational learning, Engeström (2004) describes a 'new type of work' called 'co-configuration' that has useful parallels with co-construction as a concept. According to Engeström's account (2004, p.13), co-configuration involves:

- 'Demanding' yet promising ways of working that promote and support dialogic and reflexive approaches.
- The development of 'interdependence' between all parties involved, leading to the creation of strategic collaborations with typically 'long life cycles'.
- The sharing and creation of plural understandings.

Engeström uses a series of metaphors to try and help illustrate the horizontal, negotiated nature of the learning that takes place in a culture of co-configuration. He describes the idea of 'knotworking' where participants are active and persistent in unpicking practice 'knots' to negotiate solutions (Engeström, 2004, p.17). This is a negotiated process where no single participant has authority: new learning and ways of working are created via the horizontal nature of a group rather than via the type of transmission model found in vertical hierarchies (see Engeström, 2004).

Engeström also uses idea of boundary-crossing as a process of 'collective concept formation' where we move beyond the boundaries of ideas and practices that we are familiar with (Engeström et al., 1995, p.321). When they are boundary crossing, people must bridge across ideas and concepts beyond their individual contexts to include wider perspectives and approaches. This is done through ongoing interaction and dialogue (Engeström et al., 1995, p.322). These ideas resonate with *Successful Futures* (Donaldson 2015), where the idea of subsidiarity involves the decentring of decision-making processes and the crossing of 'boundaries' to share and co-create knowledge.

Creating knowledge: co-construction as a learning activity

Creating knowledge is another key characteristic of co-construction that contrasts with knowledge sharing or transfer (Parsons, 2021). Parsons et al. (2020) write about knowledge creation in the context of co-construction in research. New knowledge – 'the what' – is created through the 'shared endeavours of research and practice working together equally (the how)' (Parsons et al., 2020, p.3). In addition, Hicks (1996) writes that learning occurs through the 'emergent, socially negotiated, and discursive activity' of co-construction (p.136). These ideas all seem particularly relevant to the *Camau i'r Dyfodol* project. The potential for new knowledge (learning) to emerge from research, practice and policy relies upon the synergy of participants within co-construction, meaning that the whole experience can be categorised under an umbrella of professional learning and development. This point is supported by van Schaik et al. (2019), who described the participation of teachers in co-construction as a *learning activity* where knowledge was constructed using various sources of evidence, with the explicit purpose of transforming practice (p.30-31).

Linking to the project's work in Wales

If co-construction can be viewed as a *learning activity* that may involve what Engeström calls knotworking, it would seem pragmatic for *Camau i'r Dyfodol* participants to be prepared for the experience to feel 'messy' and lead, potentially, to rethinking of professional ways of working. Hayward et al. (2020) state that co-construction caused stakeholders to reconsider their roles in earlier phases of CfW's development. Examples included teachers seeing the 'bigger picture', and policy leads being influenced by the workings of subsidiarity. The reconsideration of roles within a co-constructed space suggests personal reflection on previously held assumptions, ideas, and viewpoints. For co-construction to be effective, participants need to be open to engage with a series of messy transactions that will lead to new forms of knowledge and understanding. With all of this in mind, co-construction can be understood as not simply an activity but as a *disposition to new learning*.

Engeström's idea of boundary-crossing also resonated with the need for those involved in CfW to work together in groups that crossed boundaries, for example primary and secondary schools working in clusters to co-construct progression. This was seen as a strength in the *So Far So Good* report, with teachers reporting positive experiences of not only moving away from 'comfort zones' by working across school phases and specialisms, but by being part of the whole picture of the school-age curriculum (Hayward et al., 2020). We anticipate that boundary-crossing will be an important concept in Phase 2 or the project in terms of co-construction across different education partners who may be involved.

5.3 Discussion

Effective co-construction is contingent on the development of ‘thinking spaces’ to foster engagement and support the emergence of co-constructed learning and knowledge creation, as well as the *disposition to new learning*. Important characteristics of co-construction were identified in the literature that can be used in future Phases of the project to inform ways of working with and by participants.

- Co-construction needs a safe intellectual space for collaboration and co-operation. This is particularly important given that it can cause feelings of uncertainty due to its ‘messy’ nature.
- Co-construction is defined by iterative processes where ideas are refined and renegotiated through social interactions and dialogue and involves potential challenge and problem-solving.
- Co-construction provides an opportunity to reach across vertical and horizontal boundaries, foregrounding the voices of different stakeholders.
- Co-construction is a professional learning activity that builds new knowledge, theories, and insights. It requires a disposition towards learning that includes flexibility and a willingness to change.

These characteristics will be used to shape the project’s approach to co-construction going forward. For example, co-construction in *Camau i'r Dyfodol* will be thought of as a *learning activity*, with close attention paid to the intellectual and physical space that will support this learning activity to happen.

The idea of liminal space will be used to encourage flexibility and fluidity of thinking. Land et al. (2014) suggest that learning in a liminal space can encourage participants to ‘let go of customary ways of seeing

things, of prior familiar views’ (p.200). They note that this is not necessarily a benign experience, given that it can cause shifts in thinking that feel ‘uncomfortable or troublesome’ (p.200). Sibbett and Thompson (2008) describe this type of discomfort as *nettlesome*, a description that seems to chime with Engeström’s (2004) idea of knotworking to unravel metaphorical ‘knots’ in thinking about practice issues. Even though it may feel uncomfortable where knots occur and need to be unpicked, the idea of liminal space foregrounds the need for participants to suspend prior understandings so that new ideas can emerge and consolidate during a transitional time. This way of thinking about space supports the idea of working *in* and *through* co-construction, with co-construction being seen as *disposition* towards new learning. These ideas will be taken forward into Phase 2 in which a space will be created for co-construction new learning and thinking about progression.

Some questions for the project to consider in shaping its future approach to co-construction emerged through this exploration of the literature and through considerations of Hayward et al.’s (2020) research. These questions are as follows:

- *How might participants be supported in the ways of thinking that enable co-construction?* Moving away from embedded thinking associated with roles can be difficult, especially when well-established knowledge bases are being questioned. Likewise, receiving critical comment can be disappointing. A consideration of ways of working that encourage supportive criticality may be helpful.
- *How might participants be supported to understand the messiness and challenge that might occur during co-construction?* Hayward et al. (2020, pp.44-46) identify a series of challenges around co-construction, some of which may be offset

through some preparatory work for example around the power of discussion, the need for time, and the reconsideration of roles.

- *How will groups decide on the ‘knot’ or topic to be unpicked, thus reaching a shared consensus that relates to their local context and has the potential to reach across boundaries?* Reaching a shared and agreed topic amongst participants who may have differing priorities is a co-constructed process in itself – some thinking may be needed around how educational partners come to this point, and how they reimagine it for their own contexts.
- *How will a group know when the ‘period’ of co-construction has ended, and it is time to move onto something different?* Given that co-construction is an iterative process, groups will need to decide where one topic ends and where another one begins, even though definitive answers may not have been reached and contested ideas may still be playing out.

5.4 Findings in brief

- Drawing across different definitions found in the literature, co-construction is commonly described as a process of knowledge construction through collaborative practices to develop new insights and ways of working.
- *Camau i'r Dyfodol* will consider co-construction to involve a *disposition to new (professional) learning* that requires people to embrace flexible thinking and willingness to change.
- Co-construction requires collaboration and cooperation: new knowledges are not constructed in a top-down, hierarchical approach but are constructed by all participants working together to reach a shared position or approach through dialogue, shared understanding, and negotiation. These processes of co-construction require space and time to discuss, and question, accepted ways of thinking and practice, to encourage people to see beyond their individual context to wider views (Hayward et al., 2020).
- Co-construction can feel messy and uncomfortable, particularly where existing ideas and practices are challenged and/or rethought. It may be helpful to think of this process as taking place in a 'liminal' space – an intellectual, emotional, and physical space where people are *in between* old and new ways of thinking and acting. Problematic or complex issues can lead to feeling stuck; this can helpfully be thought of as reaching a knot in the co-construction process which needs unravelled before progress in co-construction can continue.

6 National Network Conversations

The *National Network for Curriculum Implementation* is a Welsh Government initiative that 'brings together teaching professionals, experts, stakeholders, policy makers and educational partners, including regional consortia and Estyn to identify and address the barriers to, and opportunities for, the implementation of CfW' (Welsh Government, 2021, par.1). A programme of National Network Conversations (NNCs) began in late 2021 and was continued into 2022 and 2023. Each conversation has a specific focus and gives interested practitioners from a variety of backgrounds the opportunity 'to get involved in national co-construction to address our shared challenges and opportunities' (Welsh Government, 2021, par.2).

One meeting of the National Network invited participants to reflect on their progress in understanding progression and assessment in relation to CfW. This provided an opportunity for the *Camau i'r Dyfodol* research team to gather data to answer the project's research questions:

- How are educational partners moving their identified priorities forward for curriculum realisation?
- What influences are there, in different professional contexts, on current and future curriculum realisation?

6.1 Methods

Fourteen conversations were held during the NNC, with a total of 167 participants. These were conducted online, and each conversation had a designated practitioner facilitator (typically a teacher or regional consortia representative). Six of the groups were attended by a member of the *Camau i'r Dyfodol* research team.

Participants were given a pre-session activity inviting them to reflect on understandings of assessment and progression linking to CfW documentation (Welsh Government, 2022). During the NNC, which lasted for approximately two-and-a-half hours, conversations were based around the following areas:

- How the principles of progression are being used to support curriculum design and the planning of learning and assessment.
- How the assessment principles are being used to support learner progression through the curriculum and to develop assessment practice.
- What approaches to co-construction have been effective in developing practice in planning and assessing progression.
- What support would be helpful to further develop professional understanding of progression and assessment and build capacity to develop curriculum and assessment that supports learner progression.

Practitioner facilitators and project researchers took notes using a template to capture key points. The facilitator notes from all 14 NNCs and researcher notes from 6 groups attended by members of the research

team comprised the data set for this activity strand.

The notes were thematically analysed by three members of the research team. Thematic analysis allows researchers to identify, organise and interpret patterns in data (Braun & Clarke, 2006, p.79). One team member analysed the researcher notes, one analysed the facilitator notes, and one worked across the dataset, with comparisons made between coding by team members working on the same data. Comparison showed a close match in the coding from researchers which provides evidence of a robust analytic process. However, qualitative researchers cannot claim to adopt a neutral stance when analysing qualitative data, since they are deciding how the data will be coded and what meanings can be made from the coding process. Care was taken during the analysis to foreground participant views so that the data support for the themes is evident.

6.2 Findings

The NNC findings are presented by theme, with additional detail for each theme provided within sub-themes.

Theme 1: Creating a shared understanding of progression

Participants used a range of approaches to create shared understanding of progression in schools and clusters. There was agreement that consistency of understanding across schools was important while still leaving scope to contextualise learning and assessment at school level. Participants said it was difficult to 'see' what progression 'looks like' in the *Progression Steps* (Welsh Government, 2020). Unpacking the language

of the principles and ‘translating’ these to school settings was time-consuming. Participants thought that collaborative working could be powerful but finding time for collaborative working was challenging. COVID-19 had made collaborative working difficult.

Creating a shared understanding: translating the principles into practice

Schools are at various stages in the journey to understanding progression and ‘translating’ the principles into practice. Clusters used different approaches to ‘unpack’ the principles. Some tried to identify what progression in AoLEs would ‘look like’ in smaller steps than the published *Progression Steps*. Others focused more broadly on gaining a sense of the 3-16 learning journey or worked to draw out common conceptual and practice ‘threads’. Some clusters focused on the four purposes of CfW to consider how learners could progress towards those aspirations for CfW. One school was using the *Principles of Progression* to get ‘the pedagogy right’; others were using them together with a ‘mastery learning’ approach or creating ‘road maps’/concept maps for each AoLE.

Several participants mentioned agreeing on ‘non-negotiables’: the concepts, knowledge and skills that should be part of the progression journey. One cluster designed a sequence of knowledge, skills, and experience with ‘a spiral effect, building on different knowledge and skills over time.’ Others spoke of the importance of agreeing on ‘threshold concepts’ (core concepts which, once grasped, transform understanding of something), ‘big ideas and essential learning. Some schools are using published schemes for teaching with a view to progression following from those.

Some participants thought it particularly important to create a consistent understanding of progression, and consistent language to

describe it. One participant felt that things might ‘fall apart’ if there was no consistency in clusters and across the system. Another said that a ‘well calibrated’ cluster was essential for successful progression from primary to secondary. However, it was recognised that the Principles of Progression needed to be contextualised at school and classroom levels. One cluster designed a middle layer of ‘concepts’ to bring clarity and cohesion to thinking about progression while still facilitating school autonomy to develop curriculum experiences. Other participants mentioned:

- Making learning ‘bespoke to our school’.
- Recognising that ‘what works for our learners and staff may not work elsewhere – the dialogue is the most important process... Schools need to agree principles rather than content’.
- Progression being a ‘thorny issue’ because it may look different across clusters and phases.
- Some also felt that many aspects of teachers’ practice prior to curriculum reform remained fit for purpose. Care should be taken not to ‘throw the baby out with the bath water’.

Working together: collaboration, school level differences and learner involvement

Groups discussed the importance of planning curriculum, progression, and assessment across the continuum of learning, by staff from different phases working together to share essential strengths and complementary skills and knowledge. COVID-19 had held up collaborative working, but some schools saw the pandemic as a chance to reinvent and ‘throw things away’. Others were more cautious, looking to retain some former ways of working ‘mapped’ into the new curriculum. Many spoke about how

important collaboration had been, particularly face-to-face meetings in clusters and regions.

Many schools liaised with partners through pre-existing networks, facilitated by regions and/or locally established groups. This was particularly apparent within Welsh-medium networks, faith networks, and smaller schools. Some clusters contacted regional consortia to work together. However, participants from special schools were not part of clusters and spoke of the isolation this caused. It could be challenging for some secondaries working with a large number of partner primary schools to understand formative feedback on progression at transition for every learner. It was also difficult for primary schools sending learners to several secondaries to build a relationship with them all.

Participants from special schools noted curriculum guidance was often not strictly relevant to them: concepts of learning and progression needed to be translated into what it would ‘look like for us.’ This translation process took a great deal of time and discussion in each special school. One participant said that it was important to understand how to support and celebrate progress ‘across smaller steps’, with particular emphasis on functional skills and Health and Wellbeing. Thinking this through with other special schools had been important.

Most NNC groups spoke about involving learners in different ways and to different extents. Examples included:

- Learners reviewing documentation and plans.
- Learners contributing ideas and aspirations to inform leadership planning.
- Taking a ‘student-influenced’ approach: retaining teacher expertise in curriculum design and progression but taking account of learner perspectives.

- Learners working together in forums to develop a shared language of progression.
- Sharing understanding of progression with learners by exemplifying the Progression Steps or creating 'conference time'.
- Providing some choice and agency over methods of assessment and involving learners in peer- and self-assessment.
- Supporting learners and parents to understand the language of progression: there were doubts that 'working towards/ within/above' would be understood.
- A key message from one participant was: 'Focus on the learner... it's about looking through the lens of a child and thinking about what the child needs, and what needs to be put in place for the child to get there.'

Barriers to understanding progression

Many participants spoke of the considerable time investment needed to engage in collaborative dialogue and co-construction. Lack of time was a 'massive barrier' and participants noted: feelings of 'desperation' about the timescale for implementation; concern over time challenge involved in reform for all schools (particularly special schools); concern over staff wellbeing and staff having reached saturation levels; mapping the curriculum having become a 'spreadsheet exercise'; and work on assessment being 'pushed back.' The announcement in 2022 of the removal of the sixth INSET day caused dismay, and COVID-19 had also reduced capacity to meet (making it harder to share understandings). Some participants noted difficulties getting cluster working up and running again. The point was made that only 'post-COVID' did schools have space and time to 'digest' the Principles of Progression. It was also suggested

that clusters may find collective change difficult to encourage where individual schools had created ways of working that were now well established.

The language, volume and perceived vagueness of the curriculum documents were seen as barriers to understanding. Comments indicated that:

- The Principles of Progression contain 'too much jargon' and are difficult to contextualise across schools/consortia.
- The principles are too complicated or too high-level to be easily understood.
- Staff have no time to unpick the language ('we need it to work now').
- 'I can' statements are too 'woolly'.
- 'We need language-accessible information on progression and assessment. How can I share that with governors; learners; parents? It's so wordy. We need something clearer.'

Some thought there was an overload of information on Hwb, the Welsh Government's online repository to support teaching and learning in Wales. 'Trawling through' the information was laborious and time-consuming. Navigation of Hwb digital content felt 'clunky.' Many said that central resources should be stripped back and show what progression looks like in practice. Some participants also described the transition from structured success criteria to vaguer statements in the new curriculum as a 'shock,' a 'leap of faith', and the most challenging and stressful aspect of the new curriculum. One participant said they understood the need to move away from levels but pointed out that teachers still needed to understand 'where learners are.' It was now difficult to know how to do this.

Theme 2: Understanding assessment

Practitioners are trying to move away from levels, 'tick box approaches', and graded summative assessments, to create meaningful ways of assessing learners (authentic, formative, and embedded in day-to-day learning). Schools and clusters are thinking carefully about how to put learners at the centre of the assessment process but most participants noted that they are at an early stage in that journey at the time the conversations were taking place (May 2022).

Assessing and reporting progression meaningfully

Many participants said they were just beginning to consider assessment in CfW. New assessment documents (Welsh Government 2022) had been put on Hwb quite recently, and understanding the *Principles of Progression* and designing the curriculum has taken time. Translating these principles into practice was challenging and weaving assessment through was difficult. However, participants spoke about a range of approaches to assess and maintain records of progress based on the idea of ongoing assessment embedded in daily practice.

Approaches to thinking about assessment were varied and the extent to which they were working well was unclear. Such approaches included:

- Drawing on Descriptions of Learning, Statements of What Matters, Progression Steps, Pedagogical Principles, and the Four Purposes to inform assessment thinking.
- Creating a generic assessment model broad enough to assess any skills/ knowledge/ understandings, but clear enough to give a framework to develop assessment practices and consider 'next steps'.

- Exploring different ways of assessing without marking, for example using comparative judgement and narrative feedback.
- Using digital portfolios, learning logs, 'pen portraits', and learner passports as records of progress.
- Using the 'Big Question' approach to link learning outcomes to assessments.

The importance of balancing qualitative and quantitative data on progress was noted. Participants were working to shift from data-driven reporting to sharing with parents and others the kinds of meaningful information that would communicate learner progression in relation to the Four Purposes and Statements of What Matters.

Challenge and uncertainty

Participants seemed confident in day-to-day assessments but were uncertain of how to track progress over time. Staff in one school are developing a tracking system built on 'open discussions' about what data is tracked. Several participants spoke of clusters agreeing to use commercial tracking solutions 'in the absence of anything else.' Groups noted uncertainty over what assessment and reporting will look like and raised specific questions about assessment:

- How do teachers meaningfully assess progression and for what purposes?
- What are the expectations about what teachers should record in terms of progress?
- How much information should be recorded and with what frequency?
- How do teachers 'measure', track, and report on progress without numerical data from levels and outcomes?

- How can schools separate 'assessment' from 'data collection'?

Some felt there was a danger of over-assessing and over-tracking; others commented that moving away from assessing against levels required a new mindset. A concern was raised that teachers might default to the old levels without examples of a 'standard' for each Progression Step. This may happen because, as one participant said, they were trying to 'fight against what we've always done.' Another said: 'The holistic intentions of understanding the individual learner are desirable but having the time to do this is a significant barrier.'

Some participants thought that the exam system prevented change at secondary level. One participant explained that curriculum leads were 'working backwards' from exam specifications which posed challenges. Another said it was hard to think in a new way when GCSEs shape expectations. It was suggested that COVID gave teachers an opportunity to look at more meaningful forms of evidence about learning than exams. There was a worry that, post-COVID, 'teaching to exams' might return.

Theme 3: Culture change

Practitioners are shifting 'mindsets' from previous ways of working, although they are on 'different stages of [their] curriculum journey.' Participants spoke of creating more authentic learning and assessment to empower learners and provide meaningful information on progress for them, their parents, and school governors. However, there was uncertainty over accountability processes and how progression would be understood in the wider system.

Supporting change: mindsets and classroom practices

There was a strong sense of participants working

with each other to shift both individual and collective mindsets to embrace curriculum change. One participant spoke of supporting new ways of working in their school by moving to a school-agreed '*schema*', rather than a *scheme*. They said: 'I thought there would be resistance, but staff are actually quite enthusiastic about it.' Another said that moving away from levels makes conversations about learning more interesting: teachers are more able to talk about what learners know and can do. Participants also spoke of the value of collaboration in culture change. One participant explained that their consortium has a lead advisor and a nominated person from each secondary and primary, for each AoLE, who meet on a regular basis to support change. Another cluster had employed a teacher on a two-day secondment to co-construct a shared vision, align progression, and consider pedagogical approaches.

Although, as mentioned earlier, some felt Hwb contained an overload of information, others found useful in supporting change as they could go back and look again at documents. However, across the groups there was discussion of the need for greater central support. It was suggested that portfolios of examples might help teachers to gain shared understanding of progression. Participants noted that case studies of practice, and people willing to share what had not worked well and why, would also be helpful, as would exemplars of 'what a good one looks like.' Some schools had spent money on external support to understand assessment and progression because support from regional consortia was a 'mixed bag.' To supplement existing support several private sector organisations and independent consultants had been commissioned by schools and regional consortia, which were perceived by participants to have saved time for schools but tended to be expensive.

One participant said that supporting 'opportunities for research led and informed practice in schools

would enable people to develop knowledge, to be critical, and to make decisions for themselves based on the school's context.' Another said that there was a need to recognise the good work going on in schools and the shared experiences and challenges felt by schools across Wales: 'The messaging from [government] needs to be consistent and 'keep calm-ish' and encourage a greater level of positivity and wider sharing of good practice and innovation.'

Concerns about accountability: change 'needs more than words'

There were some concerns about what accountability would look like in the new system. One participant said that teachers are 'held accountable for what we do with our learners,' another that 'removing accountability needs more than words – it needs system change.' The concern was that not all in the system are 'on board' with the changes. Others felt there was a need to trust and give autonomy to teachers who were working hard to develop and refine new approaches. Participants were, as yet, unsure about how progression would be linked to accountability and how assessments might be used for accountability purposes. One said that quality assurance processes were enabling effective monitoring of progress because progress is being seen in learner work and learner experiences, challenging old ways of working around national curriculum levels.

In general, there was uncertainty over what type of progression evidence Welsh Government and Estyn would require. Some wondered whether Estyn's understanding of new progression and assessment approaches would match with school and staff understandings, or would they look for data to evidence progression meaning that schools would be 'drawn into that culture of data again.' One participant worried that 'Estyn judgements

will not be in alignment with guidance around freedom to design a curriculum to meet the needs of learners in different schools and settings.'

6.3 Discussion

Aldous et al. (2022) state that practitioners in Wales are involved in a 'transformative agenda' for change (p.253). Analysis of the NNC data made clear participants' willingness to support this change despite the challenges they outlined. In his discussion of curriculum change (both internationally and with specific reference to Scotland), Priestley (2011) writes that teachers are often positioned as both agents of *and* barriers to change. He also observes that there can be gaps between policy that calls for innovation and the conditions required for those innovations to take place, noting that many school practices remain 'remarkably persistent' (p.1). In contrast, the NNC data indicates willingness to alter practice and shift mindsets, while being careful 'not to throw babies out with bathwater'. The data also provide support for MacDonald et al.'s (2016) argument that where there is 'a thoughtful, respectful, and collaborative approach to curriculum change and implementation... teachers can feel empowered due to their agency in the change process' (p.1337). However, lack of time, time challenge, and COVID all created stress for staff. Penney and Alfrey (2022) state that investment in relationships is crucial to policy change that has a transformative intent (p.219). The NNC data suggest that one of these investments needs to be time to enable relational working to flourish and afford practitioners scope to work together to understand and translate policy into practice.

The data gave strong indications of what Pyhältö et al. (2018) call 'sense-making' as an ongoing process carried out through collaboration and dialogue. If

curriculum reform does not realise its potential for sustainable transformative change, it is often because the process 'seldom manages to engage educational practitioners in shared sense-making' (Pietarinen et al., 2019, p.491). At the time the data were collected, practitioners' sense-making about curriculum, progression and assessment may not always interweave as fully as it might. However, participants seemed aware of this and of the challenges to creating an integrated approach, when stages of curriculum development occur over time, and when practitioners must ensure learning while also being involved in complex processes of designing curriculum and assessment at local levels.

However, Mellegård and Pettersen (2016) point out that educational reforms 'impose demands' for changes which are 'expected to be materialized in teachers' work' (p.181). They comment that part of the process of curriculum change involves teachers comparing the 'previous and familiar' curriculum with the 'new and unfamiliar' (p.188). Where a new curriculum does not stipulate 'how and what to teach', it needs to be 'decoded' and 'translated as a functional document' as teachers navigate the process of change to bring together the intended world of policy with the real world of their schools and classrooms (Mellegård & Pettersen, 2016, p.188). These points seem borne out by the NNC data. Practitioners had to 'translate' and make meaning from the curriculum documents before progress on design and understanding of progression could be made. Shared understandings must also be merged with the need for teachers and learners to feel ownership of the new ways of working and thinking. As MacLean et al. say, 'enabling curriculum innovation... is perhaps less about the rigid adherence to policy as inscribed in texts... but rather more akin to a process of acting to bring policy intentions into being' (2015, p.83).

6.4 Findings in brief

- Analysis of the NNC data indicate a range of influences – positive and negative – on current and future curriculum realisation.
- Schools and clusters are moving their identified priorities forward through collaboration and dialogue. Shared understandings of both progression and assessment for progression are being developed through co-construction within and across schools. Discussions are happening within clusters or a range of other networks –and learners are involved in those discussions. Different curriculum documents or other starting points have been chosen for these journeys towards shared understandings of progression, and a variety of approaches to assessing progression are currently being explored.
- Teachers are aware of the challenges of their undertaking, not least the culture change required to move from assessment that is accountability-driven to assessment that is learner-focused. They are committed to it but felt that unclear expectations about accountability and examinations, along with insufficient time creating challenges. to enacting change. There is some concern about the kinds of evidence Estyn will be looking for, and whether this will be aligned with the new approaches to progression that schools are working towards.

- Participants thought that collaborative working could be powerful but finding time for collaborative working was challenging. COVID-19 had made collaborative working difficult. Time challenge pressures were also reported to be impeding collaboration and co-construction, a situation again exacerbated by COVID-19.
- The curriculum documents themselves provide essential and central guidance to everyone involved but were perceived by some to be unclear and the volume to be too great.

7 Discussion groups

The educational landscape across Wales is varied, with schools, teachers and other education professionals working in diverse ways and with different levels of confidence in the process of curricular realisation. Phase 1 of *Camau i'r Dyfodol* included discussion groups that brought together teachers and other education professionals across the Welsh education system to explore current thinking and practice around learning progression. Knowledge of how education partners have been engaging in co-construction and working with others to build capacity, and of the perceived impacts of positive and negative contextual factors, is important for future phases of *Camau i'r Dyfodol*.

The Welsh education system is structured over three “tiers” with the Welsh Government occupying Tier 1, regional consortia, local authorities, Estyn, Qualifications Wales and HEIs occupying Tier 2 (referred to as ‘middle tier’), and schools occupying Tier 3 (Welsh Government 2017). We considered it important to invite schools as well as members of Tier 2 in this exploration to get a range of perspectives.

The discussions gave an opportunity for education professionals and researchers to explore the following aspects:

- Where school professionals and educational partners in Wales are in their current thinking around learning progression.
- How different educational partners across the system have engaged in co-construction and worked with others to build capacity.
- The different contextual factors and supports to teacher practice, or the challenges they may be facing.

These discussions allowed exploration of three of the project’s research questions:

- What influences are there, in different professional contexts, on current and future curriculum realisation?
- How are educational partners moving their identified priorities forward for curriculum realisation?
- How can new knowledge from the co-construction activity across project phases be fed back meaningfully into the system?

7.1 Methods

The discussion groups were held online to reduce COVID-19 risks, facilitate involvement for busy professionals, and support the inclusion of a geographical spread of participants. We based the discussion on the focus group method, which allows for exploring people’s perceptions and experiences (Nyumba et al., 2018). This can be done in a ‘relatively informal atmosphere’ to enable discussion of a ‘focus’ that the participants have all experienced (Parker

& Tritter, 2006, p.24). A semi-structured approach allows for ‘immediate, rich and detailed feedback’ on conversations, allowing aspects to be followed up during the discussion (Morrison et al., 2020, p.80).

Participants were selected purposively to obtain a range of views across the geographical regions of Wales. The resulting nine discussion groups included 22 participants; eight with 2-4 participants and the ninth with just 1 participant (which therefore took the form of an interview). This was a smaller number of participants than initially planned, despite multiple invitations having been issued, sometimes due to factors such as work conflicts (for example, covering for colleagues due to illness-related absence) and potentially the timing of the research within the school year. However, an initial analytical pass of the transcriptions reassured the research team that the nine discussions had provided sufficiently rich information to inform plans for the project’s second phase and so a decision was made to conclude recruitment.

Three groups involved school staff from schools that had been involved in the development of CfW (ex-pioneer schools) as well as those that had not (Tier 3); six involved participants from Estyn and professionals such as education advisers (Tier 2 or ‘middle tier’). Participants came from schools, partnerships, and consortia across Wales to ensure a range of views representing local and national contexts. One *Camau i'r Dyfodol* researcher facilitated each discussion, and these were audio and video recorded. Information about the project, a data privacy notice, consent form, and list of key questions were provided to participants for the discussion groups in advance, in both Welsh and English, and important information was reiterated verbally at the start of each session.

Discussions were semi-structured, based around sub-questions created from the project's research questions. Each discussion was scheduled for 90 minutes. Discussion recordings were transcribed and then thematically analysed using Braun & Clarke's (2006) six step approach. Two researchers analysed the data using inductive coding to organise and interpret the discussion content into three themes.

7.2 Findings

The three themes were:

1. Translating progression from policy to reality – the need to create a shared and consistent understanding of progression drawing from the curriculum documents, coupled with participants' concerns about whether schools are enacting learning progression in the “right” way. There were also concerns about progression at transition and, as with NNC findings reported earlier, worries about the influence of upper secondary examinations.
2. Moving from assessment to assessing – the need to move from assessment of learning against levels and using data for accountability, to assessing pupils in ways that support learning and communicate progression meaningfully.
3. The importance of collaboration – the benefits, but also the time challenge and time, involved in collaboration and knowledge exchange within and across schools.

A fuller exploration of these themes and their related sub-themes is given in the following pages. Participant voice is foregrounded in the analysis and the following identifiers are used for any quotations: school professional (SP) and middle-tier professional (MTP).

Theme 1: Translating progression from policy to reality

Translating progression from policy to reality is a hugely complex endeavour and the data evidenced a sense of strong collaboration, and willingness to change, but also the high levels of system-wide support and intense time challenges that have gone into creating initial understandings of progression. The comments on the system-wide support differ in these discussions from the more variable view in the NNC. However, the discussion data again evidenced that practitioners are concerned that progression should be understood consistently and are concerned about whether they are correct in their interpretations.

Understanding progression: is it consistent and is it ‘right’?

All participants spoke about the benefits of collaboration, but many noted that schools and clusters were at different stages in understanding progression. Participants said that progression and assessment were the main priorities either for them or for the schools/clusters they worked with. In terms of progression, collaboration and discussion are ongoing to refine understandings of the curriculum. Progression was proving challenging in terms of ‘unpicking’ the various curriculum frameworks to create shared understandings of how the *Progression Steps* could be interpreted in curriculum areas and specific subjects. One middle-tier participant felt that there were ‘too many considerations’ for practitioners to deal with at the local level.

Participants noted a range of ways in which they were understanding progression through discussing ‘non-negotiables’, co-constructing what ‘progress looks like’, shifting from creating curriculum topics to creating conceptual experiences for pupils by using ‘big questions’ and by considering learner perspectives.

One aspect noted consistently was the need to think carefully about the language of progression. However, the discussions evidenced a tendency to talk about progression in terms of ‘progress’:

A lot of work is being done around what progression looks like for these learners as well as how you show that progress for the learners. (SP)

The key is, can you demonstrate that children are making progress and at the appropriate pace, you know? (MTP)

We've had cluster meetings where we've looked at developing our shared understanding of progression... But we needed to get that understanding of what progress is. (MTP)

You make sure that things are planned in a way that [pupils are] achieving the progress... [towards] their individual holistic targets... as well as looking at progress over time. (SP)

The mixed language of progression/progress may indicate the complexity of making the transition from focusing on learning being evidenced through outcomes to interpreting progression in learning more holistically.

Middle tier professionals spoke about the need for a consistent ‘message’ to be given to schools particularly in terms of language:

What we're making sure is that we don't change any of the words in Curriculum for Wales because they've been written with a clear reason. And I don't think we should change those words because through changing those words, we're changing their meaning, potentially. (MTP)

[We] make sure all our staff are absolutely on message. Any queries, any questions, we take it back to source where the information lies on Hwb... (MTP)

One school practitioner also felt that the clear message from government is that 'everyone should have the same understanding about progression.' However there seemed to be some confusion over the extent to which schools and clusters can create their own understandings of the curriculum and progression if national consistency and equity are also to be ensured:

What we need to guard against here is that we don't make everything too local because we're talking about a new national curriculum operating at local level but needing to have a meaning at national level as well... otherwise we're going to be creating pockets of practice across the country that are not talking to each other at all. (MTP)

You get the argument of equity versus subsidiarity... I think we all believe this, that if you are following the guidance, you can base it on subsidiarity and get equity because you have followed the guidance. If you don't follow the guidance, we're in danger of not getting equity. (MTP)

There seems, then, to be a tension between national consistency of 'message' and following the guidance with the idea of co-constructing understanding at school and cluster level. The

discussions also raise questions about how equity and subsidiarity are being understood and whether and how subsidiarity can ensure equity.

There was a sense of different interpretations and possible misinterpretations being a feature in the system partly due to the volume of information being produced but also due to mixed messaging:

It's surprising sometimes the misconceptions in the system, but they are definitely there for various reasons. So, you know, it's really important within our role, particularly as leads within reform, that it's really clear, the messaging is clear, people are very clear about what the expectations are within the guidance because making sense of that... (MTP)

There was a Welsh Government blog that was published yesterday that exclusively talked about skills... They didn't mention knowledge or experiences once... So, I think again, is all of the system pulling in the same way? (MTP)

To sum up, we haven't got a lot of progress at all at the moment. But one of the major problems we've got... is the new Curriculum for Wales isn't about knowledge. And this has been the message from the very, very beginning. It's not a specification of what knowledge people need to know. It's how we want these children to develop and what kind of people we want them to become in the future, which is a much, much bigger issue. (SP)

I think one of the other obstacles within secondary schools at the moment that we're trying to work around is the early misconception that there was in place that the new curriculum was a skills curriculum, not a knowledge or content curriculum... (MTP)

However, one school participant commented that 'you can't interpret the Progression Steps' in terms of the knowledge and understanding needed in secondary subjects and do so consistently across schools. One middle tier participant also said they were still getting questions about 'principles of curriculum design and the AoLEs and the 27 statements of what matters'. They concluded that 'we will always be developing a shared understanding of progression. I don't think we'll ever get to the end of that.'

Participants noted that schools and teachers wonder if they have interpreted the curriculum correctly and if they have understood progression in the 'right' way. As one middle tier professional said: 'Because we're on our own, there's a risk, isn't there? There's a fear that, "Oh, what if we are getting it wrong?"' Discussions evidenced the complexity of creating understandings of the new curriculum, progression, and assessment, and how these understandings translate into practice in ways that met the requirements. This quotation sums up concerns that were seen generally in the conversations: 'have I actually designed the right learning experience? Have I assessed it in the right way? You know... it's going to be trial and error' (SP). Participants at all levels are concerned to get things 'right' for their learners but, as a middle tier participant said, 'nobody in the system knows the definitive way of doing this.'

The challenge of transition and the influence of GCSEs

Participants mentioned concerns over how to ensure progression when moving from primary to secondary, especially when secondary schools have a large number of partner primary schools. Schools and clusters are working on a range of ways to communicate at transition what primary school pupils have learned and achieved through their primary curriculum experiences:

We're quite keen on learner profiling, learner journaling, you know, so that they are using electronic sources available to them that can easily transfer then between settings. So, when a child moves from a primary school to a secondary school, that this portfolio of learner experiences that have been gathered by the learner during their time is able to move with them as they transition across that phase. (MTP)

We're also trying to co-construct with our primary colleagues in our cluster... [so] we can see their level of progression... The way they're bringing them up to where they should be where they're going to hand them over to us, and then having that ability to be able to carry on. (SP)

What we see work well is where, particularly progression between phases, primary, secondary, for example... it focuses on learning and progress, not just on the kind of pastoral support... so it truly thinks about the progress pupils make over time. (MTP)

There were also comments about thinking across the 3-16 continuum about learning and progression and the need for, as one middle tier participant said, 'really rich discussions and sharing what works'.

Another concern relates to potential washback effects from secondary level exams which might undermine the new curriculum approaches:

One of the biggest threats I think to the Curriculum for Wales as it stands at the moment is in secondary schools because there must be, and I hope I'm wrong, but there must be some exam content written... then they have to publish a specification for those exams, and as soon as that happens, all schools will go "Oh right. We know what to head for now." And we'll just go back to traditional teaching... and it goes back to where it was, and the Curriculum for Wales goes away. (SP)

One of the key things that you need to be able to plan effectively for an overview of progression is to understand your destination. And whilst we don't have any more information at the present about what the GCSEs will look like in terms of content, skills, knowledge required and how they'll be assessed... then I think there is a little bit of trepidation, a little bit of disquiet still in some secondary schools that they don't understand the ultimate destination at 14 to 16 well enough to be able to ensure that their planning is going to be sufficient. (MTP)

We have national documents, but in the end our children will leave school and will be judged against their qualifications at 16 and 18. And if we don't do our best to ensure that the children reach the higher grades then, we will be letting our children down for their future. (SP)

The sense of needing to understand a destination for learning is heightened here by the desire to make sure that pupils will be well-supported and well-prepared for any national examinations. The lack of certainty around what will change at GCSE levels is creating disquiet and suggests that system change might be better if it is planned holistically and agreed (building on practitioner and stakeholder voices and expertise) before roll-out of individual elements.

Theme 2: Moving from assessment to assessing

The discussions suggested that it was early days in terms of thinking about assessment within CfW. Partly this was due to the focus on understanding progression and partly because participants were still in the process of engaging with what was at that point recently published government information on assessment within CfW. Participants noted the willingness of practitioners to shift to new ways of working with assessment, foregrounding formative rather than summative processes, but shared worries over how to communicate progression in meaningful ways, and showed uncertainty about whether the accountability system will continue.

Assessing for learning

Across the school professional and middle tier discussions, there was recognition that the new curriculum is meant to represent a move from assessing against levels to foreground meaningful assessment and feedback on progression in learning. School professionals advocated for formative and forward-facing assessments. One middle tier participant spoke of the need to shift from thinking about assessment to assessing: 'I know it's semantics, but I think it's an important distinction... [W]e very deliberately put it to our schools that let's get this bit right first, and then we can focus on assessing.'

Participants spoke about a range of approaches to assessing learning and progression, with strong emphasis on putting learners 'at the heart' of the process:

Ultimately, assessments should be indistinguishable to teaching and learning... Schools that have really good practice are schools that have really established assessment strategies and approaches. They're using a wide range of them. They use an observational assessment to really inform them as to where the learners are. So they're capturing that learner progress really, really effectively. (MTP)

I would like to see the children doing some kind of self-tracking, with maybe a learning passport or something they log each substantial cross curricular piece of work... [I]f the children are to be independent learners, they can have the power to log and track their own progress. But we need to find a way to involve staff in this as well... (SP)

Participants mentioned both the need for accurate assessments of progression and the need to create meaningful ways of assessing and communicating that progress. One spoke of a 'mosaic' approach that their school had created to give a comprehensive sense of progression and inform next steps in learning. This approach includes 'annotated work, annotated photographs, observations, tours, mapping, video, pupil conferencing and parent conferencing' (SP).

Middle tier professionals spoke about a range of support they had given for schools and teachers and of the culture shift that is being encouraged:

Moving very much away from the ticking boxes and purchasing the off-the-shelf assessment tools, to think about what can we assess? How can we capture this progress in a really meaningful way that has a positive impact on the wellbeing of all learners, and staff as well, that doesn't become this huge monster of a task perhaps that we've been doing previously to ensure that we are capturing that progress and using that information to move the learning forward? (MTP)

We've used George McBride's resources... without being too grand about it, it's a cultural change is required here, isn't it? (MTP)

We're trying to move away from that, change the culture, change the mindset into, you know, how is it purposeful, or what is purposeful to help learners to make progress? But just lots of nerves in the system around understanding progression, which is a huge task in itself, but also assessment. How do we assess that progress...? (MTP)

Across the discussions, many practitioners tended to speak about 'capturing' and 'recording' progress as a way of *showing* progression. Practitioners across the system seem to be in a middle ground of moving from ideas of summative assessment that captures progress to formative assessment that supports learning.

The challenges of change

Several participants across the groups noted challenges around developing professional understanding of what 'assessment' means, how to move away from a stress on summative assessment and data gathering, and the need to see what the new ways of assessing look like in the classroom. Participants said:

We don't know properly how to assess... we know how to get children through exams, so actually our assessment is always summative at the end of a key stage. So that's our problem. (SP)

The question at the moment is how to assess. Because we have been using levels at this time, but now we need to think of a new way to assess and as head of the department I am rather worried about the lack of data. We can have national reading tests scores and things like that, but it isn't easy to see the whole year without levels now, so that is the big question that I have. (SP)

We feel so confused with messages from different directions and the relationship between the curriculum and assessment is – I wouldn't say it is very strong at the present time with us. (SP)

Part of the confusion relates to understanding and communicating progression over time. Participants spoke about schools 'tracking' progression. Some schools mentioned commercial tracking solutions which one school professional said 'we kind of use as our tracking tool.' A middle tier professional said that even teachers and schools who 'get progression and get the purposes and get the pedagogy' still ask 'but what about tracking?' Another commented that because there are so many commercial packages 'promising the earth,' schools and clusters are signing up for these: 'in their anxiety, they are signing up to things that aren't going to help them understand how learners make progress but is going to provide them with a set of very neat boxes that they can tick and think they can hand on to the local authority or to Estyn' (MTP). As one middle-tier professional said, there is still a tendency to 'get tied up in discussions around accountability and tracking and not really grappling with what's the role of assessing?'

Many were also worried about how to evidence and 'show' progression to stakeholders who were traditionally part of the accountability system:

We'll happily do assessment for learning... But how the heck do we go about doing that in a way that we can show to government or show to management or show to whoever's asking to say 'is the new curriculum working?' (SP)

What about Estyn? What are Estyn going to ask for? And what about my data? What data am I collecting? And how am I going to show that children are making progress in creativity? (MTP)

There's still this fear of, 'But how do we show that we've done this? How do we show that the learners have done that?' (MTP)

There was concern that accountability worries could lead to over-testing, using checklists, trying to 'cover' breadth and depth of content, and use of tracking. As a result, the concept of progression in learning is sometimes being interpreted as ensuring 'progress' is made. For example, a school professional said: 'A lot of work is being done around what progression looks like for these learners as well as how you show that progress for the learners.' A middle tier participant acknowledged that there 'is more than one way' to think about progression in learning, but 'the key is, can you demonstrate that children are making progress and at the appropriate pace, you know?'

Theme 3: The importance of collaboration

The importance and benefits of collaboration were noted by all participants. Many spoke about 'rich' discussions and co-construction and of shared learning and understanding. However, the time needed for collaboration was onerous and difficult to guarantee.

Creating collaboration and sharing practice

Overall, there was a strong sense of collaboration and co-construction being at the heart of the process of understanding and implementing CfW. School professionals noted the benefits of informal networks, for example, sharing between heads across schools. Middle tier participants also described their efforts to promote collaboration and knowledge exchange across schools:

We're always encouraging schools to share their practice. That's what we do all the time. (MTP)

We've run different projects where we've had Foundation Phase teachers and Key Stage 5 teachers in the same conversation, trying to develop that shared understanding of progression around one element that sits within the AoLE. And all the sort of feedback that we get from practitioners is the value that they find in having that conversation, because traditionally it hasn't happened. (MTP)

One middle tier partner thought that discussion between practitioners was 'a really powerful tool on that curriculum design journey.' One school practitioner said that 'unless you use co-construction, it ain't going to work... you have to involve staff, but staff then feel empowered. Staff feel involved.' Another spoke of co-construction as a way of having synergy across secondary departments and with primary schools in their cluster.

When it came to sharing practice, however, there was a 'mixed picture' as one school participant said. They felt that some schools shared 'no problem' while with others 'it's like getting blood out of stone.' Another school participant noted that some teachers feel a sense of 'oh here we go again' about curriculum change and others seemed to be 'in denial' that

significant change was happening which could have an impact on engagement with collaboration. There could also be variations in how well clusters collaborated. A middle tier participant said: 'Some clusters work very well and we're able to facilitate that co-construction very successfully. Other times, that's not the situation.'

Understanding takes time

A consistent message was that co-creating understanding takes time, particularly given the volume of curriculum documentation and the magnitude of system change. Many participants discussed the need for time to be able to think through, discuss, and plan their school approaches to learning progression. One school participant said it was 'key to take our time and not to rush into things' in order to give new ways of working the best chance of success... 'I believe that being calm, taking our time, discussing with staff have all been key.' Others noted that they had lacked time to 'actually reflect on anything and sort of try different approaches' (SP), that lack of time led to 'going round in circles' rather than making progress (SP), and 'time to talk, a time to think for whole staff groups or whole cluster groups has been challenging' (MTP). Full timetables were also a constraint to thinking and planning: 'you know, when you're teaching a full timetable in schools and then you're being expected to plan stuff around on the edges of that, on the outskirts of your timetable, it just doesn't work' (SP). There were also challenges of staff coverage for meetings and to enable release for development or secondment.

There were frustrations from some participants about the timelines for implementation and the timings of government notifications and information release, and the sheer volume of documentation:

I must say that this idea of saying this is the guideline for transferring the curriculum that must be in place, here it is 2 weeks before the end of term and it must be in place by the 1st of September, it is disgraceful. It doesn't show any understanding at all of how schools work... (SP)

You know, some of the stresses in the system are the timelines. So, stuff comes out from the Welsh Government, you know, "Curriculum for Wales summary's got to be on your website by September 22, and now your transition plan". So, both of those are done, but they're done what I call minimum spec... [W]e've hit the regulations. But some of the timelines from the Welsh Government are unrealistic. (SP)

So, the guidance documentation now on the curriculum is in excess of 300 pages of content for schools, and new guidance being released all the time. Even in the last week of term when schools' heads are fried... still things are being released... [S]chools are very busy places with very significant operational concerns that dominate their day-to-day practice... having the opportunity to wade through lengthy additional guidance is hard for them. (MTP)

Despite the severe time pressures, one middle-tier professional said that 'perhaps the most satisfying thing is that in spite of everything that's happened over the last two years and how exhausted everybody is, there's a real enthusiasm for this. People are really excited because they can see this is going to be different.' However, the data left no doubt that time and time challenge are very significant issues.

7.3 Discussion

The discussion groups explored three areas

in particular: participants' priorities in respect of CfW, understandings of co-construction in terms of supporting learning progression and views about what has been effective or could be more effective in planning for and assessing progression. Many of the findings from the discussion groups reflected those from the NNCs.

A key priority remains the understanding of progression, not just in terms of understanding the progression principles but in terms of understanding what progression 'looks like' and how learners will experience progression across the 3-16 continuum. Assessment is also being prioritised by participants, who are thinking about how to assess and communicate progression in learning meaningfully while putting learners at the heart of the assessment process.

For the participants, co-construction centres on dialogue, discussion, and sharing of ideas and practices. In terms of what was effective, collaboration and co-construction were seen as invaluable, as was primary-secondary dialogue and shared understandings of progression across formal and informal clusters and networks. What was less effective stemmed from the challenges of time, volume of information, timelines for implementation, confusion around mixed messaging, and doubts that accountability would change its nature. There also seems to be some confusion in the system around what the new curriculum is trying to be, and what balance there is between autonomy/subsidiarity and consistency/equity across the system.

As with the findings from the NNCs, we again see practitioners involved in interpreting and translating policy before it can be put into practice (Aldous et al., 2022). Curriculum, assessment, and pedagogy are being reimaged through CfW (Aldous et al., 2022). Teachers have been asked to become 'active

curriculum makers in their schools and classrooms' (Alkan & Priestley 2019, p.737). Jones (2022) argues that the shifts required to enact the new curriculum requires education professionals to 'redefine roles in order to meet shifting expectations' (p.2). Teachers in Wales are having to create new ways of working that encourage autonomy and flexibility because they 'have had their agency eroded through earlier demands for performative practices' (Jones 2022, p.2).

The system and its professionals are involved in radical change from an era of high-stakes accountability grounded in PISA and between-school comparisons to a 'renewed vision for education' based on a 'collaborative, sustainable and integrated approach to policy development' (Evans, 2022, p.382). The discussion group data shows this process of revisioning in action: the commitment and enthusiasm of practitioners sits alongside uncertainties, concerns, and tensions as professionals both make sense of the new curriculum and redefine their own roles. There is no doubt from the data of teachers' willingness to embrace change.

However, it does seem important for the system to ensure capacities at individual and system levels - not least ensuring adequate time for collaboration and sense-making together with increased clarity and reduced volume of information. The data again suggests that importance of sense-making at individual, local and system-wide levels, and supports the view of curriculum-making as a set of social and professional practices that create 'complex webs of enactment' that are both nonlinear and unpredictable (Priestley & Philippou, 2018, p.151). Pyhältö et al. (2018) note that 'shared sense-making in large-scale curriculum reform involves building bridges between old and new understanding' to re-interpret practice and achieve the reform aims (p.183). The data from the discussion groups indicate that re-

interpretation is ongoing for practitioners in Wales, but also shows the ongoing process of balancing bottom-up sense-making and top-down visions and requirements within curriculum reform (Pyhältö et al., 2018, p.196). It may be time to pause and take stock of the extent to which this balance is being achieved and consider how to promote and sustain that balance for the next phase of curriculum reform.

7.4 Findings in brief

- Analysis of the data from the group discussions revealed the complex and demanding nature of translating CfW policy to reality, but the willingness of participants to engage with it. It was clear that individuals need to be given time to do this work, and the system needs to recognise that such an approach takes time and should not be rushed. Some participants were frustrated that document volumes and publication dates combined with tight deadlines issued to schools did not seem to acknowledge this.
- Understanding of progression was being co-constructed with colleagues within and between schools, with support from middle tier partners, and this was satisfying but challenging and very time-consuming. A variety of approaches were being taken to developing this shared understanding, and participants were at various stages on that journey. Schools varied in their willingness to share practice.
- There was anxiety about whether the kinds of work being done at local level would result in inconsistent understanding of progression at a national one, and some sought greater clarity

and consistency in the language being used to describe and so discuss progression. There was some confusion over the extent to which schools and clusters can create their own understandings of the curriculum and progression if national consistency and equity are also to be ensured.

- Practitioners were generally enthusiastic about the shift towards more learner- and learning-focused formative assessment, but recognised the culture shift that such a new focus requires. Language was identified as an important factor in effective discussions about assessing and assessment which are following from work on understanding progression.
- Schools are working through the complexity of making the transition from focusing on learning being evidenced through outcomes to interpreting progression in learning more holistically. Despite enthusiastically focusing on learners, many were also still concerned about how to evidence and 'show' progression to stakeholders who were traditionally part of the previous accountability system. There was a tendency for some schools to fall back on commercial tracking solutions for that purpose. Some participants thought it was challenging to know how to communicate progression to learners, parents, teacher colleagues and Estyn.
- Concern was expressed that there could be significant washback effects of new national examinations at secondary level which could undo much of the time-consuming work that was currently being done. There was also concern that accountability pressures from Estyn could have a similar impact.

8 Summary of findings and implications

In this section of the report the findings are used to answer the research questions. Then, arising from consideration of these findings by the research team, some implications are presented for the education system in Wales, as well as for future phases of *Camau i'r Dyfodol*.

8.1 Answering the research questions

How can the relationships between curriculum, assessment and pedagogy be understood in relation to progression?

Within the NNC discussions, assessment practices were generally talked about as an integral part of curriculum and pedagogy. Similarly, the discussion group data indicate that schools seem to be in various places in terms of thinking about the relationships between curriculum, assessment, and pedagogy. For the literature review on progression, it was necessary to differentiate between the terms *progression* (as used in CfW) and *learning progressions* as used in literature. CfW uses progression very broadly while the literature uses learning progression to refer to a domain-specific cognitive model of learning that characterises the changing nature of understanding from less to more sophisticated reasoning. This type of model takes the form of guides or maps of how possible learning might progress. The project data also indicated that practitioners are using

'progress' and 'progression' interchangeably and sometime talk about a *progression curriculum*. This suggests that practitioners may be talking about progression in ways that are different to the literature on learning progression, although some may, in practice, be developing things that look like LPs as cognitive models.

LPs were discussed in the literature as important for creating alignment between curriculum, assessment, and pedagogy, but the most fully explored relationship was between LPs and assessment. The literature does not explore the interrelationship(s) between curriculum, assessment, pedagogy and progression to any great extent, although it does highlight practical challenges around using LPs. Future work is needed to conceptualise and better understand the interrelationship(s) between curriculum, assessment, and pedagogy in relation to progression.

How can co-construction be conceptualised to support sustainable educational change and knowledge building in different professional contexts?

There does not appear to be a clear definition of the concept of 'co-construction' within the setting of CfW, although the term was used commonly by participants within the NNCs and group discussions. To develop a model of co-construction for the context of this project, researchers reviewed the recent socio-political history of education reform in Wales, CfW policy documents, reports from the first Camau research project, and theory and research on co-construction and similar concepts. As a result, co-construction was conceptualised as a social learning activity that takes place within the flexibility and fluidity of a liminal space.

It is not only viewed as collaborative learning activity leading to knowledge creation, but also as a disposition towards new learning that involves 'knotworking' *in* and *through* co-construction. This definition directly informs work in Phase 2 of the project and serves as a starting point for educational professionals' critical engagement with this concept. A shared understanding of this concept is expected to continue to develop and deepen over the course of the project as more is learned about how educational partners co-construct knowledge, approaches, and resources to support progression.

What influences are there, in different professional contexts, on current and future curriculum realisation?

Within the NNCs, teachers were very positive about the idea of embracing co-construction principles. However, teachers indicated challenges impeding their co-construction activities. These challenges included a perceived lack of resources, time, partner engagement in some clusters, and capacity building within the system. Similar messages were noted in the discussion groups where participants noted that the high level of effort across the system to make sense of progression in the new CfW. The discussion groups also highlighted challenges which seemed to hinder effective curriculum realisation, including time, the volume of information provided around the new curriculum, timelines for implementation, confusion around mixed messaging they are receiving, and doubts that accountability processes will change in nature.

How are educational partners moving their identified priorities forward for curriculum realisation?

The discussion group data revealed high levels of

system-wide support and significant efforts across different educational partners that have gone into creating and supporting initial understandings of progression. Regarding *how* they are moving their priorities forward, schools have been engaging in collaboration and co-construction, engaging in primary-secondary dialogue, and creating shared understandings of progression across formal and informal clusters and networks. From the conversations, teachers were at the starting stages of thinking and schools were mixed in terms of how much progress they had made in thinking and planning in relation to progression. Participants mentioned the use of, or piloting of, approaches, techniques, programmes, maps, or toolkits to understand and monitor progression.

There appear to be several priorities emerging, the most clearly articulated was around creating a shared and consistent understanding of progression. However, potentially suppressing this movement forward are concerns from schools about whether they are enacting CfW in the 'right' way, and a lack of clarity regarding how much autonomy they have.

8.2 Implications

Implications for the system

- There seem to be tensions between autonomy for practitioners as curriculum-makers to create curricula locally, and consistency of understanding of the new curriculum across the system. It would help to clarify how much tolerance there is for varying approaches to understanding and translating CfW into practice across the system.
- Subsidiarity around learning progression must be supported in a way that still ensures equity of learning experiences for learners across Wales.

Keeping the broader curriculum purposes and directions in mind seems important for local and national coherence. To support a coherent approach to progression in learning, and to ensure alignment of curriculum, pedagogy and assessment, education partners need to be clear about the underlying curriculum model on which CfW is based, or with which it aligns.

- Further clarity is needed in use of language around progression and assessment of progression as there are some inconsistencies across research, policy documents, resources on Hwb, and educational professionals regarding terms used. Teachers want to know what progression looks like. They would find specific exemplars helpful.
- Progression as used in CfW is a very broad concept and does not seem to align with the more specific understanding of learning progression(s) (LPs) as described in the literature. Given their domain-specific nature, it is uncertain how useful a concept LPs are for use within CfW given the more integrated nature of the Areas of Learning and Experience. Clarification of the role of disciplines in CfW would help to understand this more fully.
- The form and role of accountability in relation to different approaches across the system and ways of understanding CfW is critical. The requirements of Estyn should be aligned with CfW's vision, aspirations and expectations of teachers and schools. It would help to provide more certainty in the system if an aligned approach to inspections was communicated as widely, as early and as clearly as possible.
- The washback effects of upper secondary examinations if they are not fully aligned with CfW represent a significant risk for curriculum realisation. The system needs to strive for vertical

alignment of assessment approaches. If this is not achieved, tensions may arise for teachers in satisfying the needs of a national assessment system that is not aligned with formative and (teacher-designed) summative assessments that are focused on progression in learning.

- The process of co-construction is challenging, and it will be important for Welsh Government to convey their confidence in the process and try to foster a culture of openness to change at all levels. To support this, it would be helpful to have further clarity regarding expectations for how CfW might evolve in response to suggestions that emerge from ongoing development and co-construction activities across Wales.

Implications for the project

The findings of Phase 1 informed several practical implications for the project going forward.

- Work is needed to conceptualise and better understand the interrelationship(s) between curriculum, assessment, and pedagogy in relation to progression.
- It would be helpful as part of the project to research what information parents/carers find most useful in understanding learner progression.
- Co-construction in *Camau i'r Dyfodol* will be thought of as a *learning activity*, with close attention paid to the intellectual and physical space that will support this learning activity to happen. Some of the challenges of co-construction may be offset through preparatory work, for example around the power of discussion, the need for time, and the reconsideration of roles. It would seem pragmatic for participants to be prepared for the experience to feel 'messy' and lead, potentially, to rethinking of professional

ways of working. The project will think carefully how to support participants in this for Phase 2.

- Given that co-construction is an iterative process, groups will need to decide where one topic ends and where another one begins, even though definitive answers may not have been reached and contested ideas may still be being playing out.
- Opportunities for co-construction activities, and how these might feed back into the system, also need to consider knowledge creation rather than only knowledge exchange.

8.3 In conclusion

Co-construction of approaches to support progression in learning in Wales is currently within a liminal space – a space between understandings - as educational partners engage in shared ‘knotworking.’ The findings in Phase 1 suggest a desire across the system to create a shared and consistent understanding of ‘progression’. There seems to be some incoherence across research, policy documents and educational partners regarding terms such as learning progression, progression in learning, and progress. Creating a shared and clear understanding of the meaning of these terms would provide coherence to better support educational partners to translate their understanding into practice. New aspects of knowledge that may be needed to feed into the wider education system include:

- practical approaches to acknowledging the idiosyncratic nature of pupil learning;
- appreciating the epistemological differences in terms of understanding and teaching different disciplines;

- considering how to move from previous practices of assessment of learning against levels (using data for accountability purposes) towards new approaches to assessing pupils in ways that support learning and communicate progression meaningfully.

The understandings developed in Phase 1 – the challenges identified, the implications drawn from these for education partners at all levels, and some of the solutions proposed - will inform the design of the co-construction activity in Phase 2 of the project and beyond. Reflecting upon these findings, Phase 2 of the *Camau i'r Dyfodol* project has been designed to bring together teachers, educational partners, and researchers as a ‘Professional Co-construction Group’. This group will identify priority areas and opportunities that will help to advance practical understandings of learning progression for those involved in realising the new curriculum. It will work through these using evidence from research, policy, and practice to co-develop approaches and resources that are both helpful and valuable to the work of schools and partner organisations across Wales.

9 References

- Aharonian, N. (2021). Making it count: teacher learning in liminal spaces. *Professional Development in Education*, 47(5): 763-779.
- Aldous, D., Evans, V., Lloyd, R., Heath-Diffey, F. & Chambers, F. (2022). Realising curriculum possibilities in Wales: Teachers' initial experiences of reimagining secondary physical education. *Curriculum Studies in Health and Physical Education*, 13(3): 253-269.
- Alkan, S.H. & Priestley, M. (2019). Teacher mediation of curriculum making: The role of reflexivity. *Journal of Curriculum Studies*, 51(5): 737-754.
- Alonzo, A.C. (2018). An argument for formative assessment with science learning progressions. *Applied Measurement in Education*, 31(2): 104-111.
- Alonzo, A.C. & Elby, A. (2019). Beyond empirical adequacy: Learning progressions as models and their value for teachers. *Cognition and Instruction*, 37(1): 1-37.
- Alonzo, A.C. & Steedle, J.T. (2008). Developing and assessing a force and motion learning progression. *Science Education*, 93(3): 389-421. DOI: 10.1002/sce.20303
- Arias, N.M. & Kieffer, M. (2022). Participatory Action Research for the assessment of Community-Based Rural Tourism: a case study of co-construction of tourism sustainability indicators in Mexico. *Current Issues in Tourism*. Early online publication: <https://doi.org/10.1080/13683500.2022.2037526>
- Bailey, A.L. & Heritage, M. (2014). The role of language learning progressions in improved instruction and assessment of English language learners. *TESOL Quarterly*, 48(3): 480-506.
- Ball, S.J. (2003) The teacher's soul and the terrors of performativity. *Journal of Education Policy* 18(2): 215-228.
- Black, P., Wilson, M. & Yao, S-Y. (2011). Road maps for learning: A guide to the navigation of learning progressions. *Measurement: Interdisciplinary Research and Perspectives*, 9(2-3): 71-123.
- Bloom, B. (1968). Learning for mastery. *Instruction and Curriculum: RELCV Topical Papers and Reprints*. Accessed from <https://eric.ed.gov/?id=ED053419>
- Bonsall, A., Bianchi, L. & Hanson, J. (2020). A scoping literature review of learning progressions of engineering education at primary and secondary school level. *Research in Science & Technological Education*, 40(3): 407-430.
- Bourke, B. (2014). Positionality: Reflecting on the Research Process. *The Qualitative Report*, 19(33): 1-9.
- Bouw, E., Zitter, I. & de Bruijn, E. (2021.) Exploring Co-Construction of Learning Environments at the Boundary of School and Work Through the Lens of Vocational Practice. *Vocations and Learning*, 14, 559–588.
- Bowers, N., Merritt, E. & Rimm-Kaufman, S. (2020). Exploring teacher adaptive expertise in the context of elementary school science reforms. *Journal of Science Teacher Education*, 31(1): 34-55.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3: 77-101.
- Briggs, D.C., Diaz-Bilello, E., Peck, F., Alzen, J., Chattergoon, R., & Johnson, R. (2017). *Using a learning progression framework to assess and evaluate student growth*. Center for Assessment Design Research and Evaluation (CADRE). Boulder: University of Colorado.
- Byrne, J.A. (2016). Improving the peer review of narrative literature reviews. *Research Integrity and Peer Review*, 2: 1-4.
- Castleberry, A. & Nolen, A. (2018). Thematic analysis of qualitative research data: is it as easy as it sounds? *Currents in Pharmacy Teaching and Learning*, 10(6): 807-815.
- Cardace, A., Wilson, M. & Metz, K.E. (2021). Designing a learning progression about micro-evolution to inform instruction and assessment in elementary science. *Education Sciences*, 11(10): 609-631.
- Clarke, V. & Braun, V. (2017). Thematic analysis. *The Journal of Positive Psychology*, 12:3, 297-298.
- Cisterna, D. & Gotwals, A.W. (2018). Enactment of ongoing formative assessment: Challenges and opportunities for professional development and practice. *Journal of Science Teacher Education*, 29(3): 200-222.
- Conroy, J.C. & de Ruyter, D.J. (2009.) Contest, contradiction and security: The moral possibilities of liminal education. *Journal of Educational Change*, 10: 1-12.
- Corcoran, T.B., Mosher, F.A. & Rogat, A. (2009). Learning progressions in science: An evidence-based approach to reform. *CPRE Research Reports*. Available at: https://repository.upenn.edu/cpre_researchreports/53
- Covitt, B.A., Gunckel, K.L., Caplan, B. & Syswerda, S. (2018). Teachers' use of learning progression-based formative assessment in water instruction. *Applied Measurement in Education*, 31(2): 128-142.

- Dauncey, M. (2016). In brief: Improving school standards. *Senedd Research*. Last updated 27th May 2021 [Blog] Available at: <https://seneddresearch.blog/2016/06/10/improving-school-standards/> (Accessed 20th November 2022)
- De Arment, S.T., Reed, E. & Wetzel, A.P. (2013). Promoting adaptive expertise: A conceptual framework for special educator preparation. *Teacher Education and Special Education*, 36(3), 217–230.
- Donaldson, G. (2015). *Successful Futures*. Welsh Government.
- Duncan, R.G. & Hmelo-Silver, C. (2009). Learning progressions: Aligning curriculum, instruction, and assessment. *Journal of Research in Science Teaching*, 46(6): 606-609.
- Duschl, R.A. (2019). Learning progressions: framing and designing coherent sequences for STEM education. *Journal of Disciplinary and Interdisciplinary Science Education Research*, 1(4): 1-10.
- Duschl, R., Maeng, S. & Sezen, A. (2011). Learning progressions and teaching sequences: a review and analysis. *Studies in Science Education*, 47(2): 123-182.
- Engelhard Jr., G. & Sullivan, R.K. (2011). An Ecological Perspective on Learning Progressions as Road Maps for Learning. *Measurement: Interdisciplinary Research & Perspective*, 9:2-3, 138-145.
- Engeström, Y., Engeström, R. & Kärkkäinen, M. (1995). Polycontextuality and boundary crossing in expert cognition: Learning and problem solving in complex work activities. *Learning and Instruction*, 5(4): 319-336.
- Engeström, Y. (2004). New forms of learning in co-configuration work. *Journal of Workplace Learning* 16: 11-21.
- Engeström, Y. (2007). Enriching the theory of expansive learning: Lessons from journeys toward coconfiguration. *Mind, Culture, and Activity*, 14(1-2): 23-39.
- Evans, G. (2022). Back to the future? Reflections on three phases of education policy reform in Wales and their implications for teachers. *Journal of Educational Change*, 23: 371-396.
- Fereday, J. & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods*, 5(1): 80–92.
- Fonger, N.L., Stephens, A., Blanton, M., Isler, I., Knuth, E. & Gardiner, A.M. (2018). Developing a learning progression for curriculum, instruction, and student learning: An example from mathematics education. *Cognition and Instruction*, 36(1): 30-55.
- Fortus, D. & Krajcik, J. (2012). ‘Curriculum Coherence and Learning Progressions.’ In B.J. Fraser, K. Tobin & C.J. McRobbie (Eds.), *Second International Handbook of Science Education*. Dordrecht: Springer.
- Furtak, E.M. (2012). Linking a learning progression for natural selection to teachers’ enactment of formative assessment. *Journal of Research in Science Teaching*, 49: 1181-1210.
- Furtak, E.M., Circi, R. & Heredia, S.C. (2018). Exploring alignment among learning progressions, teacher-designed formative assessment tasks, and student growth: Results of a four-year study. *Applied Measurement in Education*, 31(2): 143-156.
- Gallacher, T. & Johnson, M. (2019) “Learning Progressions”: A historical and theoretical discussion. *Research Matters*, 28: 10-16.
- Gotwals, A.W. (2018). Where are we now? Learning progressions and formative assessment. *Applied Measurement in Education*, 31(2): 157-164.
- Green, B.N., Johnson, C.D. & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. *J. Chiropr Med*, 5(3): 101-117.
- Hammer, D. & Sikorsky, T-R. (2015). Implications of complexity for research on learning progressions. *Science Education*, 99(3): 424-431.
- Harris, L.R., Adie, L. & Wyatt-Smith, C. (2022). Learning progression-based assessments: A systematic review of student and teacher uses. *Review of Educational Research*, 20(10): 1-45.
- Hayes, D. (2003). Making Learning an Effect of Schooling: Aligning curriculum, assessment and pedagogy. *Discourse: Studies in the Cultural Politics of Education*, 24(2): 225-245.
- Hayward, L. et al. (2020). *So Far So Good: Building the Evidence Base to Promote a Successful Future for the Curriculum for Wales*. Project Report. University of Glasgow & Yr Athrofa.
- Hayward, L. et al. (2018). *Learning about Progression: CAMAU Research Report*. University of Glasgow, Glasgow. Available at SSRN: <https://ssrn.com/abstract=3806612>
- Hicks, D. (1996). Contextual inquiries: A discourse-oriented study of classroom learning. In D. Hicks (Ed.), *Discourse, Learning, and Schooling*. New York: Cambridge University Press.
- Hopkin, J. & Owens, P. (2015). Progression in global learning. *Teaching Geography*, 40(2): 60–61.
- Hughes, M. (Ed) (1996). *Progression in Learning. Bera Dialogues 11*. Clevedon, Philadelphia, Adelaide: Multilingual Matters.
- Huynh, N.T., Solem, M. & Bednarz, S.W. (2015). A road map for learning progressions research in Geography. *Journal of Geography*, 114(2): 69-79.

- Jacoby, S. & Ochs, E. (1995). Co-construction: an introduction. *Research on Language and Social Interaction*, 28(3): 171-183.
- Jarvis, S., Bowtell, J., Bhanja, L. & Dickerson, C. (2016). Supporting professional learning and development through international collaboration in the co-construction of an undergraduate teaching qualification. *Professional Development in Education*, 42(3): 403-422.
- Jin, H., Mikeska, J.N., Hokayem, H. & Mavronikolas, E. (2019a) Towards Coherence in curriculum, instruction, and assessment: A review of learning progression literature. *Science Education*, 103: 1206-1234.
- Jin, H., van Rijn, P., Moore, J.C., Bauer, M.I., Pressler, Y. & Yestness, N. (2019b) A validation framework for science learning progression research, *International Journal of Science Education*, 41:10, 1324-1346.
- Jones, V. (2022). Environmental Education and the new curriculum for Wales: An evaluation of how a family of schools in a rural area used a Theory of Change approach. *Environmental Education Research*. Early online publication: DOI: 10.1080/13504622.2022.2137470
- Kimbell, R. (1994). Progression in learning and the assessment of children's attainments in technology. *International Journal of Technology and Design Education*, 4: 65–83.
- Kobrin, J.L., Larson, S., Cromwell, A. & Garza, P. (2015) A Framework for evaluating learning progression on features related to their intended uses. *Journal of Educational Research and Practice*, 5(1): 58-73.
- Land, R., Rattray, J. & Vivian, P. (2014). Learning in the liminal space: a semiotic approach to threshold concepts. *Higher Education*, 67: 199-217.
- Leach, J., Driver, R., Millar, R. & Scott, P. (1997). A study of progression in learning about 'the nature of science': issues of conceptualisation and methodology, *International Journal of Science Education*, 19(2): 147-166.
- Lehrer, R. & Schauble, L. (2015). Learning progressions: The whole world is NOT a stage. *Science Education*, 99(3): 432-437.
- Lombard, F., Merminod, M., Widmer, V. & Schneider, D.K. (2018). A method to reveal fine-grained and diverse conceptual progressions during learning. *Journal of Biological Education*, 52(1): 101-112.
- MacDonald, A., Barton, G., Baguley, M. & Hartwig, K. (2016). Teachers' curriculum stories: Perceptions and preparedness to enact change. *Educational Philosophy and Theory*, 48(13): 1336-1351.
- MacLean, J., Mulholland, R., Gray, S. & Horrell, A. (2015). Enabling curriculum change in physical education: the interplay between policy constructors and practitioners. *Physical Education and Sport Pedagogy*, 20(1): 79-96.
- Mays N. & Pope C. (2000) Qualitative research in health care. Assessing quality in qualitative research. *BMJ*, 320: 50-52.
- McDonald, S., Bateman, K., Gall, H., Tanis-Ozcelik, A., Webb, A. & Furman, T. (2019). Mapping the increasing sophistication of students' understandings of plate tectonics: A learning progressions approach. *Journal of Geoscience Education*, 67(1): 83-96.
- Mellegård, I. & Pettersen, K.D. (2016). Teachers' response to curriculum change: balancing external and internal change forces. *Teacher Development*, 20(2): 181-196.
- Menter, I. (2016). *Teacher education making connections with curriculum, pedagogy and assessment*. (Vols. 1-2). SAGE Publications Ltd.
- Milligan, L. (2016). Insider-outsider-inbetweener. Researcher positioning, participative methods and cross-cultural research. *Compare: A Journal of Comparative and International Education*, 46(2): 235-250.
- Mills, M. M. & McGregor, G. (2016). Learning not borrowing from the Queensland education system: lessons on curricular, pedagogical and assessment reform. *The Curriculum Journal*, 27(1): 113-133,
- Mohan, L. & Plummer, J. (2012). Exploring challenges to defining learning progressions. In A. C. Alonzo & A.W. Gotwals (Eds.) *Learning progressions in science: Current challenges and future directions*. Sense Publishers.
- Morrell, L., Collier, T., Black, P. & Wilson, M. (2017). A construct-modeling approach to develop a learning progression of how students understand the structure of matter. *Journal of Research in Science Teaching*, 54(8) 1024–1048.
- Morrison, D., Lichtenwald, K. & Tang, R. (2020). Extending the online focus group method using web-based conferencing to explore older adults online learning. *International Journal of Research & Method in Education*, 43(1): 78-92.
- Nuttall, J. (2003). Influences on the Co-construction of the Teacher Role in Early Childhood Curriculum: Some examples from a New Zealand childcare centre. *International Journal of Early Years Education*, 11(1): 23-31.
- Nyumba, T., Wilson, K., Derrick, C.J. & Mucherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, 9: 20-32.

- OECD (2020). *Achieving the New Curriculum for Wales. Implementing Education Policies*. OECD Publishing: Paris. Available at: <https://doi.org/10.1787/4b483953-en><https://doi.org/10.1787/4b483953-en>
- Olmos-Vega, F.M., Stalmeijer, R.E., Varpio, L. & Kahlke, R. (2023). A practical guide to reflexivity in qualitative research: AMEE Guide No. 149. *Medical Teacher*, 45(3): 241-251.
- Orchard, J. & Winch, C. (2015). What training do teachers need? Why theory is necessary to good teaching. *Impact*, 22: 1-43.
- Parker, A. & Tritter, J. (2006). Focus group method and methodology: Current practice and recent debate. *International Journal of Research & Method in Education*, 29(1): 23-37.
- Parsons, S., Kovshoff, H. & Ivil, K. (2020). Digital stories for transition: Co-constructing an evidence base in the early years with autistic children, families and practitioners. *Educational Review*, 74(6): 1-19.
- Parsons, S. (2021). The importance of collaboration for knowledge co-construction in 'close-to-practice' research. *British Educational Research Journal*, 47(6): 1490-1499.
- Penney, D. & Alfrey, L. (2022) Reading curriculum policy and (re)shaping practices: the possibilities and limits of enactment. *Curriculum Studies in Health and Physical Education*, 13(3): 214-222.
- Pham, D.N., Wells, C.S., Bauer, M.I., Wylie, E.C., & Munroe, S. (2021). Examining three learning progressions in middle-school mathematics for formative assessment. *Applied Measurement in Education*, 34(2): 107-121.
- Pierson, A.E., Clark, D.B. & Sherard, M.K. (2017). Learning progressions in context: Tensions and insights from a semester-long middle school modeling curriculum. *Science Education*, 101: 1061-1088.
- Pietarinen, J., Pyhältö, K. & Soini, T. (2017). Large-scale curriculum reform in Finland – exploring the interrelation between implementation strategy, the function of the reform, and curriculum coherence. *The Curriculum Journal*, 28(1): 22-40.
- Pietarinen, J., Pyhältö, K. & Soini, T. (2019). Shared Sense-making in curriculum reform: Orchestrating the local curriculum work. *Scandinavian Journal of Educational Research*, 63(4): 491-505.
- Priestley, M. (2011). Schools, teachers, and curriculum change: A balancing act? *Journal of Educational Change*, 12(1): 1–23.
- Priestley, M. & Philippou, S. (2018). Curriculum making as social practice: complex webs of enactment. *The Curriculum Journal*, 29(2): 151-158.
- Pyhältö, K., Pietarinen, J. & Soini, T. (2018). Dynamic and shared sense-making in large-scale curriculum reform in school districts. *The Curriculum Journal*, 29(2): 181-200.
- Rozas, L.W. & Klein, W.C. (2010). The Value and Purpose of the Traditional Qualitative Literature Review. *Journal of Evidence-Based Social Work*, 7(5): 387-399.
- Santelices, V. & Wilson, M. (2022). Aligning teacher assessments and teacher learning through a teacher learning progression. *Educational Assessment, Evaluation and Accountability*. Early online publication: <https://doi.org/10.1007/s11092-022-09388-w>
- Schenkels, A. & Jacobs, G. (2018). 'Designing the plane while flying it': concept co-construction in a collaborative action research project. *Educational Action Research*, 26:5, 697-715.
- Schneider, R.M. & Plasman, K. (2011). Science teacher learning progressions: A review of science teachers' pedagogical content knowledge development. *Review of Educational Research*, 81: 4. 530-565.
- Shea, N.A. & Duncan, R.G. (2013). From theory to data: The process of refining learning progressions. *The Journal of the Learning Sciences*, 22: 7-32.
- Shepard, L.A. (2018). Learning progressions as tools for assessment and learning. *Applied Measurement in Education*, 31(2): 165-174.
- Sibbett, C. & Thompson, W. (2008). 'Nettlesome knowledge, liminality and the taboo in cancer and art therapy experiences: Implications for teaching and learning'. In Land R, Meyer JHF, and Smith J (Eds) *Threshold Concepts within the Disciplines. Educational Futures, Vol 16*. Brill – Sense Publishing.
- Siemon, D. (2021). Learning progressions/trajectories in mathematics: Supporting reform at scale. *Australian Journal of Education* 65(3): 227–247. DOI: 10.1177/00049441211045745
- Sikorski, T-R. (2019) Context-dependent “upper anchors” for learning progressions. *Science & Education*, 28: 957-981.
- Siraj-Blatchford, I. (2008). Understanding the relationship between curriculum, pedagogy and progression in learning in early childhood. *Hong Kong Journal of Early Childhood*, 7(2): 6-13.
- Slavin, R.E. (1987). Mastery learning reconsidered. *Review of Educational Research*, 57(2): 175-213.
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104: 333-339.
- Songer, N.B., Kelcey, B. & Gotwals, A.W. (2009). How and when does complex reasoning occur? Empirically driven development of a learning progression focused on complex reasoning about biodiversity. *Journal of Research in Science Teaching*, 46(6): 610-631.

- Sparks, J.R., van Rijn, P.W. & Deane, P. (2021). Assessing source evaluation skills of middle school students using learning progressions. *Educational Assessment*, 26(4): 213-240.
- Steedle, J.T. & Shavelston, R.J. (2009). Supporting valid interpretations of learning progression diagnoses. *Journal of Research in Science Teaching*, 46(6): 699-715.
- Stevens, S.Y., Shin, N. & Krajcik, J.S. (2009) *Towards a model for the development of an empirically tested learning progression*. Paper presented at the Learning Progressions in Science (LeaPS) Conference, June 2009, Iowa City, IA. Accessed from: <https://education.msu.edu/projects/leaps/proceedings/Stevens.pdf>
- Sullanmaa, J., Pyhältö, K., Pietarinen, J. & Soini, T. (2019). Curriculum coherence as perceived by district-level stakeholders in large-scale national curriculum reform in Finland. *The Curriculum Journal*, 30:3, 244-263.
- Turner, V. (1985). *On the Edges of the Bush: Anthropology as Experience*. Tucson: University of Arizona Press.
- Tytler, R. (2018). Learning progressions from a sociocultural perspective: response to “co-constructing cultural landscapes for disciplinary learning in and out of school: the next generation science standards and learning progressions in action”. *Cultural Studies of Science Education*, 13: 599–605.
- Van Schaik, P., Volman, M., Admiraal, W. & Schenke, W. (2019). Approaches to co-construction of knowledge in teacher learning groups. *Teaching and teacher Education*, 84: 30-43.
- Vuopala, E., Näykki, P., Isohätälä, J., Järvelä, S. (2019). Knowledge co-construction activities and task-related monitoring in scripted collaborative learning. *Learning, Culture and Social Interaction*, 21: 234-249.
- Wellstead, A., Evans, B. & Sapeha, H. (2018). Policy Advice from Outsiders: The Challenges of Policy Co-construction. *International Journal of Public Administration*, 41(14): 1181-1191.
- Wilson, M. (2009) Measuring progressions: Assessment structures underlying a learning progression. *Journal of Research in Science Teaching*, 46(6): 716-730.
- Wyner, Y. & Doherty, J.H. (2017) Developing a learning progression for three-dimensional learning of the patterns of evolution. *Science Education*, 101: 787-817.
- Webster, J. & Watson, R.T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *Management Information Systems Quarterly*, 26(3): xiii-xxiii.
- Welsh Government (2014). *Qualified for Life: An education improvement plan for 3 to 19-year-olds in Wales*. Welsh Government.
- Welsh Government (2017). *Education in Wales: Our National Mission; Action plan 2017–2021*. Welsh Government.
- Welsh Government (2020). *Curriculum for Wales*. Hwb. Available at: <https://hwb.gov.wales/curriculum-for-wales>
- Welsh Government (2021). *National Network for Curriculum Implementation*. Hwb. Available at: <https://hwb.gov.wales/curriculum-for-wales/national-network-for-curriculum-implementation/>
- Welsh Government (2021). Renew and reform: supporting learners’ wellbeing and progression Our education COVID-19 recovery plan. Hwb. Available at: <https://www.gov.wales/sites/default/files/pdf-versions/2021/10/1/1635151075/renew-and-reform-supporting-learners-wellbeing-and-progression.pdf>
- Welsh Government (2022). *Curriculum for Wales: Designing your curriculum*. Hwb. Available at: <https://hwb.gov.wales/curriculum-for-wales/designing-your-curriculum>
- Welsh Government (2022). *Supporting learner progression: Assessment guidance*. Hwb. Available at <https://hwb.gov.wales/curriculum-for-wales/assessment-arrangements/supporting-learner-progression-assessment-guidance>
- Williams, E.N. & Morrow, S.L. (2009). Achieving trustworthiness in qualitative research: A pan-paradigmatic perspective. *Psychotherapy Research*, 19:4-5, 576-582.
- Wyse, D., Hayward, L., & Pandya, J. Z. (2016). [The SAGE handbook of curriculum, pedagogy and assessment](#). SAGE Publications Limited: London.