Meaning Over Information: The Anchored Experiential Meaning-Making (AEMM) Framework for Inclusive Experiential Learning

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ABSTRACT:
Experiential learning is widely used and, when well designed, it raises engagement and improves outcomes. Two problems limit its value for special and inclusive education. Studies often report that an activity worked without explaining why, so the finding does not travel, and strong practice tends to stay inside the institutions that build it. Learners with disabilities are affected most by both problems, because they gain more from hands on science than from text-based science yet are the least likely to be offered it. This paper proposes the Anchored Experiential Meaning-Making (AEMM) framework, developed as a conceptual synthesis of established learning theories. A learner layer names five ordered processes, engaged immersion, enabling safety, epistemic curiosity, conceptual meaning-making, and continued commitment, with conceptual meaning-making as the pivot that separates meaning from information. Each process is required to be reachable by more than one route, which is the design rule that universal design and inclusive pedagogy impose. An institutional layer describes how a higher education institution can anchor practice and diffuse it to ordinary and special schools through a train the trainer cascade. The learner layer is operationalized as a proposed nineteen item instrument, the Experience Survey, offered for future validation with appropriate ethical approval. The framework is presented as an explanation to be tested and a blueprint to be adapted.

Keywords: inclusive education, experiential learning, universal design for learning, conceptual framework, higher education outreach

1. Introduction

Learning by doing is one of the oldest ideas in education and one of the most durable. From Dewey to the present, teachers have used direct experience to close the distance between an idea and its meaning for the learner (Dewey, 1938; Kolb, 1984). The approach is popular because it appears to work. A large synthesis of undergraduate science, engineering, and mathematics teaching found that active approaches lowered failure rates and raised examination scores when compared with lecturing (Freeman et al., 2014), and a meta-analysis across four decades has linked experiential pedagogies to improved learning

outcomes (Burch et al., 2019). The difficulty is that popularity has run ahead of explanation. Many educators' design experiential activity by trial and error, guided by an opinion of what works rather than by theory, and the resulting studies report that an activity helped without specifying the mechanism through which it helped (Yardley et al., 2012; Krath et al., 2021).

This matters for two reasons. First, an effect that is not understood does not transfer. If a study shows that a tinkering session improved understanding but does not identify the processes that produced the improvement, a teacher in another subject or another region has no principled way to reproduce it. Second, the field has leaned heavily on a single model. Kolb's experiential theory, with its cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation, has been the default account for decades (Kolb, 1984; Kolb and Kolb, 2005). Its influence is deserved, but scholars have criticized its cyclical and linear form, its individualist emphasis, and the strength of its empirical base, and have argued that other constructs are needed to explain how experience becomes understanding (Fenwick, 2000; Seaman, 2008). A framework that draws on several theories, rather than one, is more likely to capture what happens in a rich experiential episode.

A further gap sits outside the psychological literature. Even where an institution builds excellent experiential practice, that practice tends to stay inside the institution. Universities and technical institutes with the staff, laboratories, and funding to develop strong hands-on teaching rarely have a repeatable structure for carrying it to the schools and colleges around them, where the need is greatest and the resources are smallest. The result is a widening distance between well-resourced centers and ordinary classrooms. Closing it requires more than good activities. It requires a design for how an institution generates practice, demonstrates it publicly, and diffuses it to other teachers in a way that survives after the first visit.

A third gap sits inside the other two, and it is the one that matters most for special and inclusive education. Students with disabilities achieve well below their peers in science, and the reasons are documented. They include difficulty with reading, writing, and number work, thin background knowledge, and behavior that an ordinary classroom is not organized to absorb (Villanueva et al., 2012). What is said less often is that the remedy is already known. When science is taught by doing rather than by reading, learners with disabilities gain substantially, and inquiry and activity-based teaching outperforms textbook teaching for this group by a clear margin (Scruggs et al., 1993; Therrien et al., 2011). Scruggs and Mastropieri put it plainly, that in special education constructed learning beats instructed learning (Scruggs and Mastropieri, 2007). Experiential learning is therefore not an enrichment activity for these students. It is the approach the evidence favors, and it is the approach they are least likely to receive, because hands on science needs equipment, space, and a confident teacher, and the schools with the highest proportion of children with functional difficulties tend to have least of all three (Rajkhowa et al., 2026).

This paper responds to these gaps by proposing the Anchored Experiential Meaning-Making framework, abbreviated as AEMM. The objectives are, first, to specify the psychological engine of meaning-making as an ordered set of five constructs that explain why experience teaches; second, to specify an institutional architecture through which a higher education institution can anchor experiential practice and diffuse it to schools and colleges, including special and inclusive schools; third, to operationalize the learner layer as a proposed instrument, the Experience Survey, whose name captures the central claim that experiential learning should aim at meaning rather than at the transfer of information; and fourth, to set the design under an inclusive constraint, so that each construct is reachable by more than one route and the framework speaks to the learners who need it most.

The framework is theory informed in the manner of recent work that integrates multiple learning theories into a design tool for experiential learning rather than relying on Kolb alone (Archer et al., 2026). Its distinctive contribution is to state, in an ordered way, the psychological processes that turn experience into meaning, and to pair them with an institutional architecture for diffusing the practice that produces those processes. The remainder of the paper is organised to match a conceptual development. Section 2 sets out the methodology through which the framework and its instrument were constructed. Section 3 presents the framework as the result of that work. Section 4 discusses how the framework addresses the gaps, its inclusive reading, its implications for institutions, and its limitations. Section 5 concludes.

Several terms are used loosely in the wider literature, so it is worth stating how they are used here. Experiential learning is treated as an umbrella for approaches in which a learner processes knowledge, skills, or attitudes through a high level of active involvement rather than through reception alone (Hoover and Whitehead, 1975; Doolittle et al., 2023). Meaning making is used in the sense drawn from Bruner and from the conceptual change tradition, namely the process by which a learner reorganizes prior ideas so that an experience becomes intelligible and connected rather than merely recorded (Bruner, 1990; Posner et al., 1982). Inclusive pedagogy is used in the sense of Florian and Black-Hawkins, namely teaching that extends what is ordinarily available to everyone rather than differentiating for some inside a lesson built for the rest (Florian and Black-Hawkins, 2011). Universal Design for Learning is the design rule that follows from it, requiring multiple means of engagement, representation, and action and expression to be built in from the start (Meyer, Rose, and Gordon, 2014). Table 1 collects the key terms.

Table 1. Key terms and how they are used in this paper.

Term	Working definition	Sources
Experiential learning	A way of learning in which the learner processes knowledge, skills, or attitudes through active involvement rather than reception alone; an umbrella for inquiry, design, problem based, community, and maker approaches.	Hoover and Whitehead, 1975; Doolittle et al., 2023
Meaning making	Reorganizing prior ideas so that an experience becomes intelligible and connected, not merely recorded; the core of learning meaning rather than information.	Bruner, 1990; Posner et al., 1982
Signature pedagogy	A characteristic form of teaching through which a field inducts learners into ways of thinking and doing.	Shulman, 2005
Anchor institution	An organization that uses its people, expertise, and resources to strengthen the region around it; here, a higher education institution.	Rogers, 2003
Train the trainer	A cascade in which experts prepare teachers, who then teach their own students, multiplying the reach of a single program.	Rogers, 2003
Inclusive pedagogy	Teaching that extends what is ordinarily available to everyone, rather than differentiating for some within a lesson designed for the rest.	Florian and Black-Hawkins, 2011
Universal Design for Learning	A design rule requiring multiple means of engagement, representation, and action and expression to be built in from the start, on the assumption that learner variability is ordinary.	Meyer, Rose, and Gordon, 2014

Note. Definitions are stated as used in this paper; sources indicate the tradition each term is drawn from.

2. Methodology

This is a conceptual paper. Its purpose is to build a framework rather than to report an empirical test, and its method is the disciplined synthesis and ordering of existing theory that conceptual work of this kind requires. A conceptual paper earns its standing not from data but from the rigor of the reasoning that connects its sources, and the absence of a stated method is a substantive weakness in such work rather than a stylistic one (Jaakkola, 2020). The approach taken here has four steps, described below, and it follows the same logic of theory led design used in recent work on experiential learning (Archer et al., 2026).

2.1 Design

The framework was developed as a theory synthesis. Rather than deriving a model from a single parent theory, the work assembled a set of established learning theories, each of which explains one part of how a lived experience becomes durable understanding and arranged them into an ordered account. This is a synthesis and adaptation design in Jaakkola's terms, in which the contribution is a new arrangement of existing constructs that makes visible a relationship the separate theories leave implicit (Jaakkola, 2020). The design is grounded in a research led experiential teaching program at a technical institute, whose documented pedagogies, reverse engineering, design and making practica, community immersion, a low cost tinkering laboratory, storytelling and cinematic science, and serious games, supplied a concrete picture of experiential practice against which the theoretical account was checked for completeness and plausibility.

2.2 Theory selection

Theories were selected against two criteria. The first was conceptual distinctiveness, so that each theory included in the framework explains a process the others do not. The second was sustained use in empirical research on classroom and out of school learning, so that each theory has an established record of being operationalized and tested. Applying these criteria produced the set summarized in Table 2. The set spans the affective, cognitive, and social dimensions of an experiential episode and includes the two design traditions, universal design and inclusive pedagogy, that decide whether the account reaches every learner. The review behind this selection is deliberate and grounded rather than exhaustive; it does not claim to be a systematic review of every theory that might bear on experiential learning, and a later version may add a construct that this selection omits.

Table 2. Learning theories selected for the framework and their contribution to experiential meaning-making.

Theory	Contribution to experiential meaning-making	Key reference
Constructivism	Learners build understanding by acting on experience and reconciling it with prior ideas; social interaction and the zone of proximal development make shared meaning possible.	Piaget, 1970; Vygotsky, 1978
Experiential learning theory	The movement from concrete experience through reflection to abstract conceptualization and new action; foundational but critiqued as linear and individualist.	Kolb, 1984; Fenwick, 2000
Active learning and ICAP	Deeper cognitive engagement, in which learners construct and interact rather than passively receive, yields better outcomes; explains why doing beats watching.	Chi and Wylie, 2014; Freeman et al., 2014
Flow theory	Deep absorption arises when challenge meets skill; the immersion that opens an experiential episode and sustains attention.	Csikszentmihalyi, 1990

Theory	Contribution to experiential meaning-making	Key reference
Self-determination theory	Autonomy, competence, and relatedness drive intrinsic motivation and its internalization into lasting interest.	Ryan and Deci, 2000
Interest development	A four-phase movement from a situational spark to enduring individual interest; the bridge from one session to continued commitment.	Hidi and Renninger, 2006
Curiosity as information gap	Curiosity is felt as a deprivation when a gap in one's understanding is noticed; the engine of exploratory questioning.	Loewenstein, 1994
Conceptual change	Durable learning requires dissatisfaction with a prior conception before a more intelligible one is adopted; the heart of meaning over information.	Posner et al., 1982; Vosniadou and Brewer, 1992
Control-value theory of emotions	Enjoyment and other academic emotions arise from perceived control and value; safety and value shape whether learners engage.	Pekrun, 2006
Psychological safety	A climate in which questions, mistakes, and interpersonal risk are safe supports the exploration that learning requires.	Edmondson, 1999
Constructionism and make learning	Building shareable artefacts externalizes and consolidates understanding; the basis of tinkering and design pedagogies.	Papert, 1980; Blikstein, 2013
Situated learning and communities of practice	Knowledge is embedded in authentic activity and social participation; grounds community immersion and the diffusion of practice.	Lave and Wenger, 1991; Wenger, 1998
Narrative and cinematic framing	Story organizes experience into meaning and makes abstract forces imaginable; the basis of storytelling and cinematic science.	Bruner, 1990; Dahlstrom, 2014
Diffusion of innovations	A practice spreads through a social system by demonstration and trusted intermediaries; grounds the train the trainer cascade.	Rogers, 2003
Universal Design for Learning	Learner variability is expected rather than exceptional; each construct must be reachable by more than one route, so the design does not depend on reading, writing, or speech alone.	Meyer, Rose, and Gordon, 2014; Capp, 2017
Inclusive pedagogy	What is offered is extended to everyone rather than adapted for some; sets the standard the learner layer has to meet.	Florian and Black-Hawkins, 2011

Note. ICAP denotes the interactive, constructive, active, and passive framework of engagement.

2.3 Framework construction

The selected theories were grouped by the process each explains, and the groups were ordered to reflect the sequence in which they operate during a rich experiential episode. Immersion, safety, and value describe getting in. Curiosity and conceptual change describe the turn at which understanding is reorganised. Interest, artefacts, story, and community describe what carries a single insight forward. This grouping produced the five ordered constructs of the learner layer, with conceptual meaning-making placed at the center as the pivot that separates meaning from information. The institutional layer was then derived from the diffusion literature and from the documented outreach practice of the reference program, giving five functions through which an institution generates practice and carries it outward. Universal Design for Learning and inclusive pedagogy were applied as a cross-cutting constraint overall, so that every construct in the learner layer is required to be reachable by more than one route. The relationships among the constructs are stated as testable propositions rather than as demonstrated results, which is what a conceptual framework offers to later empirical work.

2.4 Instrument design

To make the learner layer testable, a self-report instrument was drafted in which each item is a plain first-person statement about a learner's experience of a session. Nineteen items were written to operationalize the five constructs, with each item mapped to a single construct and to the theory that justifies it, as set out in Section 3 and Table 3. The instrument, named the Experience Survey, is presented here as a proposed measure. It has not yet been validated. A recommended response format, a six-point agreement scale with no true zero, is specified so that the instrument is ready for a properly designed validation study, and the psychometric work required before any measurement claim can be made is set out in Section 4. Any future administration involving school age participants will require ethics committee approval and informed consent from participants and guardians, obtained in advance.

3. Results: The Proposed AEMM Framework

The result of the synthesis is a single structure with two connected layers, a set of signature pedagogies that link them, and three foundations that run through the whole. The learner layer, or meaning-making engine, names five ordered processes that turn a lived experience into durable understanding. The institutional layer, or anchor and diffuse architecture, names five functions through which a higher education institution generates experiential practice and spreads it to schools and colleges. The signature pedagogies are the concrete forms of teaching through which the institution produces the learner processes. The three foundations, a grounding in local knowledge traditions, a principle of low and no cost design, and the joining of self-report with objective measurement, shape every part. Figure 1 presents the framework.

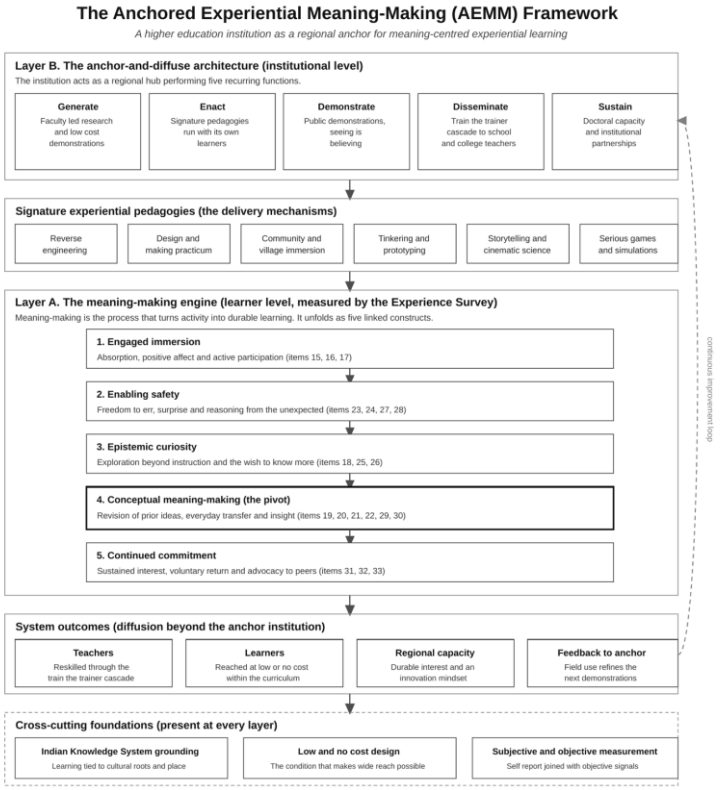

Figure 1. The Anchored Experiential Meaning-Making framework. The institutional layer generates and diffuses practice; the signature pedagogies deliver it; the learner layer converts the experience into meaning through five ordered constructs, with conceptual meaning-making as the pivot. Three foundations run through the whole.

3.1 The learner layer: a meaning-making engine

The learner layer is the psychological core of the framework and its answer to the question of why experiential learning works. It holds that experience becomes durable understanding through five processes that occur in a characteristic order, and that a design succeeds to the extent that it produces them. The order matters, because each process makes the next possible.

- **Engaged immersion.** The learner is absorbed and actively involved rather than watching, drawing on flow and on the active learning and ICAP evidence that construction beats reception (Csikszentmihalyi, 1990; Chi and Wylie, 2014).
- **Enabling safety.** The learner feels safe to question, manipulate, and make mistakes, and reflects on surprising results, drawing on psychological safety and on control-value theory (Edmondson, 1999; Pekrun, 2006).
- **Epistemic curiosity.** The learner notices a gap in understanding and wants to close it, wanting to try variations and to know more after the session ends, drawing on the information gap account of curiosity (Loewenstein, 1994).
- **Conceptual meaning-making.** The pivot. A prior idea is found wanting and a more intelligible one takes its place; the learner can now explain what was observed in terms of a principle and connect it to everyday life, drawing on conceptual change (Posner et al., 1982; Vosniadou and Brewer, 1992).
- **Continued commitment.** Interest outlasts the session; the learner intends to return, to study more, and to recommend the experience to others, drawing on interest development and self-determination theory (Hidi and Renninger, 2006; Ryan and Deci, 2000).

The claim that gives the framework its name is that a design should be judged by conceptual meaning-making, not by the delivery of information. A session that entertains and engages but produces no conceptual change has failed on its own terms, however lively it was. Because each construct is defined behaviorally, each can be measured, which is what the Experience Survey is built to do.

3.2 Signature pedagogies

Between the institution and the learner sit the signature pedagogies, the characteristic forms of teaching through which the five processes are produced. The framework does not prescribe a single method; it identifies a family of low-cost methods, drawn from the reference program, that are well matched to the constructs. Reverse engineering, in which learners take apart a working object to see how it functions, opens curiosity and drives conceptual change. Design and making practica, in which learners build a working artefact, externalize understanding in the constructionist manner (Papert, 1980). Community and village immersion places learning in an authentic setting in the situated tradition (Lave and Wenger, 1991). Tinkering and prototyping in a low-cost laboratory give the immersion and safety on which the later processes depend. Storytelling and cinematic science use narrative to make invisible forces imaginable (Dahlstrom, 2014). Serious games and simulations compress a complex system into a playable model. Each pedagogy is chosen because it is inexpensive enough to be reproduced in an ordinary school and because it reliably produces one or more of the five constructs (Shulman, 2005; Hmelo-Silver, 2004; Prince and Felder, 2006; National Research Council, 2009).

The pedagogies earn a second justification when they are read against the needs of learners who vary, and the two justifications point the same way. Reverse engineering and tinkering carry almost no reading load. A learner who cannot decode a paragraph can still take a pump apart and watch what the piston does, which is why activity-based science produces larger gains for students with learning disabilities than text-based science does (Scruggs et al., 1993; Brigham, Scruggs, and Mastropieri, 2011). Design and making let a learner express understanding by building rather than by writing. Storytelling and

cinematic science supply a second representation of a phenomenon for a learner who does not get it from the equation, and the puppet and body work reported by Masson and colleagues shows how far a non-verbal route into meaning can be pushed, in that case with deafblind participants (Masson et al., 2025). Multisensory presentation has an established record with dyslexic learners (Eryilmaz and Balci, 2025). Community immersion puts the learner in a setting where competence is shown by doing rather than by test performance, which changes who counts as able (Beda et al., 2026).

3.3 The institutional layer: an anchor and diffuse architecture

The institutional layer is the framework's answer to the structural gap. It describes how a higher education institution can act as a regional anchor, using its people and resources to strengthen the schools and colleges around it, through five functions that form a cycle, since what is learned from diffusion feeds back into what the institution generates.

- **Generate.** Faculty research produces low-cost demonstrations and activities that make abstract principles visible and that an ordinary classroom can afford.
- **Enact.** The institution runs the signature pedagogies with its own learners, refining them into dependable designs.
- **Demonstrate.** The institution shows the practice publicly, so that visiting teachers and students witness what is possible.
- **Disseminate.** Through a train the trainer cascade, the institution prepares schoolteachers and college faculty, including staff of special and inclusive schools, who then teach their own students, multiplying reach far beyond what direct teaching could achieve (Rogers, 2003).
- **Sustain.** Doctoral capacity and partnerships with industry, government, and corporate social responsibility funders keep the cycle running and feed evidence back into what is generated.

Two of the five functions carry extra weight when the receiving schools are inclusive ones. Dissemination through a cascade rests on the teacher, and teacher readiness is the constraint inclusive education keeps running into. A review of teacher readiness for inclusive education under India's National Education Policy found competency gaps rather than unwillingness (Gupta, Shrotriya, and Agrawal, 2026), and the pattern is not confined to India, since teachers in Kuwait report feeling underprepared for students with mild to moderate disabilities (Alazemi and Larkins, 2025) and early career inclusive specialists describe working in someone else's field without the standing to change how it is played (Weisling and Toson, 2025). Sustain matters for the same reason. Inclusive practice decays when the institution behind it loses interest, and accessibility, teacher capacity, and environmental support must be held in place by leadership rather than by goodwill (Rakesh et al., 2026).

3.4 Three foundations

Three commitments run through both layers. The first is a grounding in local knowledge traditions, which supplies stories, examples, and ways of reasoning that connect new material to the learner's own cultural world, and which keeps the framework transferable, since another region would ground it in its own traditions. Grounding learning in local knowledge is also a stated national policy priority in the reference setting (Ministry of Education, Government of India, 2020), and it has an inclusive edge that is easy to miss, since a learner taught in a language that is not the one spoken at home carries a load before the science even begins (Behera et al., 2026). The second is the principle of low and no cost design, which is not a reluctant constraint but a design rule, since wide reach is only possible when the demonstration costs little enough that a school with no laboratory can still use it. The third is the joining of self-report with objective measurement, so that the learner's own account, captured by the Experience Survey, can be paired with objective signals of engagement such as facial thermography and heart rate variability,

giving the framework a triangulation strand that most experiential studies lack.

3.5 Operationalizing the learner layer: the Experience Survey

The learner layer is made testable as the Experience Survey, a proposed nineteen item self-report instrument in which each item is a plain first-person statement about the learner's experience of a session. Table 3 maps every item to its construct and to the theory that justifies it. The instrument is offered as a measure ready for validation, not as a validated scale. Its recommended response format is a six-point agreement scale, which removes the ambiguity of an anchor that confounds strong disagreement with a missing answer and gives a clean scale with no true zero (DeVellis, 2017).

Table 3. Mapping of the nineteen proposed Experience Survey items to the five constructs and their theoretical basis.

Item	Statement	Construct	Theoretical basis
1	I was completely absorbed in the workshop activities and lost track of time.	Engaged immersion	Flow
2	I felt genuinely excited during the experiments, not just curious out of obligation.	Engaged immersion	Flow, SDT
3	I actively participated rather than just watching others do the activity.	Engaged immersion	Active learning, ICAP
4	When something unexpected happened, I tried to figure out why.	Enabling safety	Conceptual change
5	I felt comfortable manipulating the equipment and was not afraid to make mistakes.	Enabling safety	Psychological safety
6	The observations I made today felt genuinely surprising or unexpected.	Enabling safety	Curiosity
7	I paused at some point and thought deeply about what was happening and why.	Enabling safety	Reflection
8	I found myself wanting to try variations of the experiment beyond what was instructed.	Epistemic curiosity	Curiosity
9	I wanted to know more about the topic even after the experiment ended.	Epistemic curiosity	Interest
10	I wondered what would happen if the experiment was done differently.	Epistemic curiosity	Curiosity
11	After this workshop I understand the underlying scientific concept better than before.	Conceptual meaning-making	Conceptual change
12	I can now explain what I observed in terms of a scientific principle or concept.	Conceptual meaning-making	Conceptual change
13	Something I believed about this topic turned out to be wrong or incomplete.	Conceptual meaning-making	Conceptual change
14	I could connect what I saw to phenomena I have noticed in everyday life.	Conceptual meaning-making	Transfer
15	The workshop challenged me to rethink something I thought I already understood.	Conceptual meaning-making	Conceptual change
16	I felt a moment where something genuinely clicked for me.	Conceptual meaning-making	Insight
17	After this workshop I am more interested in studying science than before.	Continued commitment	Interest, SDT

Item	Statement	Construct	Theoretical basis
18	I would voluntarily attend a follow up session on a related topic.	Continued commitment	Interest
19	I would recommend this workshop to my friends or classmates.	Continued commitment	Advocacy

Note. SDT denotes self-determination theory; ICAP denotes the interactive, constructive, active, and passive framework. Items are numbered in their proposed running order.

4. Discussion

4.1 How the framework addresses the gaps

Three gaps were identified in Section 1. The psychological gap is addressed by the learner layer, which names the five processes and their order, so that a new site knows which processes to design for and can, in principle, measure whether they occurred. The structural gap is addressed by the institutional layer, which specifies the five functions and the train the trainer cascade that multiplies reach. Because the layers are joined by the signature pedagogies and shaped by the three foundations, the framework is at once an explanation of why experiential learning works and a blueprint for producing and spreading it. The inclusive gap is addressed by the constraint that runs across the whole design, discussed next.

4.2 The inclusive reading

Cutting across the five constructs is a commitment about who the design is for. Universal Design for Learning holds that variability among learners is ordinary rather than exceptional, and that a curriculum should be built to expect it (Meyer, Rose, and Gordon, 2014). Its three principles map onto the learner layer without strain. Multiple means of engagement is a claim about immersion and safety. Multiple means of representation is a claim about how a gap in understanding can be noticed by a learner who does not read well. Multiple means of action and expression is a claim about how conceptual change can be shown by a learner who cannot write it down. Read this way, universal design is not an addition to the framework but a constraint on every construct in it. Each of the five processes has to be reachable by more than one route, or the framework describes only the learners who were going to succeed anyway. The evidence for universal design is real but bounded, with a meta-analysis of pre and post studies finding consistent improvement in the learning process and no demonstrated effect on outcomes (Capp, 2017), and its use in inclusive inquiry science has been worked out in practice (Dymond et al., 2006; Watt et al., 2013).

Enabling safety deserves weight in this reading. A learner who has failed publicly in science for years does not experiment freely in front of classmates. The relationship with the teacher and the sense of participating in the life of the school predict engagement for adolescents with and without autism (Morales, Perez-Salas, and Zanartu, 2025), and feedback that a learner experiences as fair rather than as judgement matters to students with learning difficulties in ways it may not to their peers (Karkkulainen, Pihlainen, and Karna, 2025). For a student who carries a history of failure, safety is the precondition most likely to be missing, and the one a visiting workshop is least likely to think about. None of this turns the framework into a special education framework. It makes it a framework whose constructs must survive contact with the full range of learners, which is the test Florian and Black-Hawkins set for any pedagogy claiming to be inclusive (Florian and Black-Hawkins, 2011).

4.3 Implications for institutions adopting the framework

The framework is designed to be portable. An institution that wishes to become an experiential anchor for its region does not need the exact activities of the reference program; it needs to perform the five functions with its own resources and its own culture. Table 4 turns the institutional layer into a working guide, giving for each function the point in the cycle at which it applies and the questions an adopting institution should ask itself. The low-cost principle and the train the

trainer cascade is what make the model reach ordinary classrooms, and the grounding foundation should be adapted to the region's own knowledge traditions rather than imported wholesale.

Table 4. A guide for an institution adopting the framework.

Function	When it applies	Guiding questions for the adopting institution
Generate	Ongoing, research led	Which principles do local learners find hardest, and what low-cost demonstration would make each one visible in an ordinary classroom? Does the demonstration still work for a learner who cannot read the worksheet?
Enact	Before diffusion	Which signature pedagogies fit our subjects and our learners, and have we refined them into dependable designs with our own students first? Did we trial them with learners who vary, or only with the ones already succeeding?
Demonstrate	Public, recurring	How do we let visiting teachers and students see the practice in action? Can a special educator watching this see themselves running it on Monday?
Disseminate	The multiplier	How do we prepare schoolteachers and college faculty to run the practice themselves, and how do we support them after the first workshop? Are the teachers we train the ones who teach the children who need this most?
Sustain	Continuous	What doctoral capacity and what partnerships with industry, government, and funders will keep the cycle running and feed evidence back in? Who is accountable when the funding ends?

Note. The functions form a cycle: what is learned in dissemination feeds back into what is generated. The second question under each function is the inclusive addition.

These questions are not decorative. Indian law now obliges higher education institutions to make themselves accessible, and the distance between the statute and the campus is well documented (Bhargava et al., 2026). Social policy supporting inclusion exists on paper in most systems (Kumar et al., 2026). Whether it reaches a particular classroom often depends on whether someone with a laboratory decided to carry it there. A cascade that hands a teacher a low-cost demonstration, shows them how to run it, and returns a term later is aimed at exactly the readiness gap that policy on its own has not closed (Mosala and Sefotho, 2025).

4.4 Limitations and future research

Several limitations should be stated plainly. The review of theory behind the framework is deliberate and grounded, but it is not a systematic review of every theory that might bear on experiential learning, so a relevant construct may have been left out. The framework is conceptual, and neither of its two layers has yet been empirically validated. The Experience Survey is proposed rather than validated. Before it can support any measurement claim it requires item review, a properly powered administration, a confirmatory factor analysis of the five-factor structure, a formal test of the mediation claim that places conceptual meaning-making at the pivot, and an assessment of measurement invariance across learner groups. The reference program is a single institution in one country, so the institutional layer, while designed to be transferable, has not yet been shown to work elsewhere. The objective measures named in the third foundation, thermography and heart rate variability, are proposed as a triangulation strand and have not yet been joined to the survey in a reported study.

The inclusive reading of the framework is a design argument rather than a finding, and it should be labelled as such. The instrument is itself part of the problem, since a nineteen-item self-report in written English is not accessible to

every learner it claims to measure, and a learner who cannot read the items cannot report on the immersion the framework says they experienced. Before the Experience Survey is used in special or inclusive settings, the item wording needs checking for reading load, the response format needs an accessible alternative, and the constructs need testing for measurement invariance across learners with and without identified needs. Any future study involving school age or otherwise vulnerable participants must secure ethics committee approval and informed consent from participants and their guardians before data are collected. Until that work is done, the inclusive claims here rest on the literature on science teaching for learners with disabilities and on universal design, and the paper should be read that way.

5. Conclusion

Experiential learning is effective, but the field has too often reported that an activity worked without explaining why, and the best practice has stayed inside well-resourced institutions. This paper has proposed a framework that answers both problems at once. By naming five ordered processes through which experience becomes meaning, with conceptual change as the pivot that separates meaning from information, the framework explains why a well-designed experience teaches. By naming five institutional functions and a train the trainer cascade, it shows how a higher education institution can produce that kind of experience and carry it to the schools and colleges around it. A family of low-cost signature pedagogies links the two, and a grounding in local knowledge, a commitment to low-cost design, and the joining of self-report with objective measurement shape the whole. The learner layer is made testable as the proposed Experience Survey, whose validation, with appropriate ethical approval, is set out as the next step.

One consequence of the argument deserves stating on its own. The learners who stand to gain most from experiential science are the ones least likely to be given it, and the reason is not pedagogical disagreement but the absence of equipment, confidence, and a route by which good practice travels. An institution that already has all three can supply them. That is what the institutional layer is for, and it is why the framework is offered to special and inclusive education rather than to well-resourced classrooms that were managing anyway. The framework is offered not as a finished truth but as a scaffold, an explanation to be tested and a blueprint to be adapted, so that meaning, and not merely information, becomes the aim of experiential learning wherever it is practiced.

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8. Author Declaration

- The authors confirm that this paper is their original work
- There is no conflict of interest.
- As a conceptual paper, this study did not involve the collection of data from human participants, and no ethics committee approval was therefore required.