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THE ROLE OF EVALUATION AS AN EDUCATIONAL SPACE PLANNING TOOL

INTRODUCTION

When an educational facility is to be built or refurbished, ideally a team of educators, designers and governing educational bodies' representatives work together to ensure the facility reflects the educational institution's beliefs, the needs of the teaching staff, and the desired learning outcomes of its students. The ultimate aim should be to ensure the new facility supports the learners in the most effective way based on latest developments in educational theory, and research into 'what works' in spatial design. In reality, however, few educational space designs enjoy this level of scrutiny, most being designed and built with little input from educators. Under some circumstances an educational space planner (ESP) is employed as an intermediary between the designers, the builders, policy stakeholders, the school administration, the teaching teams, and the students. The role of the ESP is to ensure the design accommodates the school's educational vision and performs *pedagogically* as well as operationally. In this regard, the ESP occupies a highly advantageous position, owning equal insight into the design and educational aspirations of a build and being uniquely positioned to evaluate the degree to which the project is successful. Interestingly, little research has evaluated the impact of the ESP on the actual outcome of an educational project of this sort. This chapter explores the evaluative potential of the educational space planner.

CONTEXT

It is when innovative approaches to learning are a goal, when spaces to support this innovation are explored, and when a strong alignment between the educational institution's teaching and learning and strategic plans and the physical space is envisioned, that an educational space planner is most relevant. In this context, the design process arguably becomes a highly collaborative event in which effective communication between experts in different fields is the key to the success of the design (Griffin, McGaw, & Care, 2012). It is also important to ensure that both the students and the wider community have a voice in this process and their needs and opinions are considered as far as possible (Woolner, McCarter, Wall, & Higgins, 2012).

   The result that is sought is often an innovative solution or set of solutions, a step away from what other educational institutions are currently doing. While in the tertiary sector there is usually a strong educational and strategic vision that new spaces have to support more often than not in schools, the opportunity for a new building or a major refurbishment is perceived and embraced as a catalyst for change, innovation and transformation at many levels.

   Linking of pedagogy and space requires the matching of so-called 21st Century aspirations for teaching and learning to contemporary learning space design. This often implies a whole organisational change in which the alignment of new spaces,

new curriculum, new delivery methods and new use of technology rely on an associated cultural change (Woolner et al., 2012). An ESP can assist in this process to ensure all components work together to create a successful and supportive environment that is welcomed by the learning community.

This requires extensive community involvement. Changes that aspire to be transformational and innovative should be managed through the early engagement of the whole learning community in the design process and the establishment of a common language that both educators and designers understand. The ESP has expertise in both architectural design of educational institutions and educational theory, and thus should be capable of facilitating meaningful dialogue between the parties. The role of the ESP remains relevant by ensuring that any recommendations are based on either academic research or, if this is not available, previously documented experience. What this means is that the provision of valid evidence is a continuous imperative for an ESP, and finding good evidence for recommendations is often a key task and challenge. The OECD's Innovative Learning Environments Project (OECD, 2013) acknowledges this when describing the 'nature of innovation':

> Where there is scope for transforming structures, the processes to do this are complex with multiple stakeholders. Often those involved – parents, governments, and teachers – require convincing as to the need for, and nature of, the innovation (p.10).

The ESP must ensure innovative educational practices are accommodated within a new facility design, and that the design reflects the needs and aspirations of the whole school community.

THE ROLE OF THE EDUCATIONAL SPACE PLANNER

With increased use of ESPs, their critical intermediary role is becoming better understood, and can be summarised as containing eight aspirational goals.

1. The ESP has knowledge of all specialist disciplines involved in the development. The ESP must act as the prime interface between the design team[1] and the learning community[2] and should do so in a variety of ways. First, the ESP facilitates a common basic understanding of concepts and language between all. Second, the ESP defines the key educational, cultural and strategic aspirations of the school and possible translation into spatial solutions. Third, as the design evolves, the ESP enables the team to undertake collaborative problem solving exercises to overcome the range of issues that arise throughout the design process, while remaining true to the agreed educational aspirations. In this way the learning community and the design team are able to co-create learning environments for

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[1] In this context, the design team refers to the architects, landscape designers, interior designers, engineers, IT specialists, etc. Often the ESP is considered as part of this team.

[2] Learning community refers to educators, students, members of the wider community and relevant governing educational bodies.

new and emerging teaching, learning and research paradigms. The nature of the work of an ESP is fundamentally collaborative.

2. *The ESP adheres to a set of 'principles' that ensure successful implementation of a design.* The processes that build and maintain innovations, and the strategies required to transfer visions into new practices and ultimately spaces across the learning institution, need to be understood by all for effective implementation. The architectural design for an educational facility, either a new build or a refurbishment, is one of these processes. It responds to many parameters that are fixed but at the same time must also respond to a range of variables, in particular the educational model. How are the students going to be grouped? What kind of relationships should the space enable? These and other issues are reflected in OECD's listing of the characteristics of innovative environments (OECD, 2013), summarised in Table 1 below.

Table 1: Adapted from OECD Characteristics of Innovative Learning Environments (OECD, 2013)

Principle 1	Learner Centred	The Learning Environment makes learning central, encourages engagement, and develops an understanding of their own activity as learners.
Principle 2	Social	The Learning Environment is where learning is social and often collaborative
Principle 3	Personalised and Inclusive	The Learning Environment is highly attuned to the learners' motivations and the key role of emotions.
Principle 4	Personalised and Inclusive	The Learning Environment is acutely sensitive to the individual differences among the learners including their prior knowledge.
Principle 5	Personalised and Challenging	The Learning Environment is demanding for each learner but without excessive overload.
Principle 6	Structured and well designed	The Learning Environment uses assessments that are consistent with its aims, with strong emphasis on formative feedback.
Principle 7	Integrated	The Learning Environment promotes horizontal connectedness across activities and subjects, in- and out-of-school.

3. *The ESP is conversant with the latest educational theories that must be facilitated by the development.* School design is inescapably linked to the changing of workforce requirements. In this highly digitalised industrial age the skills

needed by the main occupations rest on the capacity to develop, distribute and consume products. The focus is moving to the production, distribution and consumption of information. This has implications for education, as individuals increasingly need to develop a new set of skills to respond to workforce requirements (Earthman, 2009; Myers, 2004).

In recent years organisations such as the OECD have explored what skills define the 21st century learner. Summarised as mixing traditional skills and new skills (Griffin et al., 2012), the OECDs ACT21S summarises these into the following four categories: (1) Ways of thinking, which includes creativity and innovation, critical thinking, problem-solving, learning to learn and the development of metacognition; (2) Ways of working, which includes communication, collaboration and teamwork; (3) Tools for working, which includes information and ICT literacy; and (4) Living in the world, which includes an emphasis on local and global citizenship, aspects of life and career development and personal and social responsibility.

The ESP must be conversant with not only the development of these rapidly changing aspirations but also be adept at how they translate into practices in the classroom.

4. The ESP must be skilled at envisioning educational aspirations spatially. Designing spaces to facilitate the pedagogies that modern epistemologies create is a challenge for the ESP; classrooms and schools must not only meet current teaching practice needs, but also the hard-to-define pedagogies required to address future learning. Planners and designers of modern day learning environments[3] are required to recognize that a complexity of needs creates the context of an 'emergent learning environment' and must design facilities to suit and present the learning community with a responsive and holistic design to address these needs. Listed below, these needs embrace the domains of what is to be learned, who is doing that learning, the role of the wider community, and the attributes of the design to address these needs.

Learning

– The planning principles discussed above: learning as learner centred, social, personalized and inclusive, structured and well designed, and also integrated. (OECD, 2013);
– 21st century skills (Griffin et al., 2012);
– The articulation of a clear pedagogical vision and educational model - by or in collaboration with the school;
– The integration of educational technologies - the extent and aspirations for their use (Johnson, Adams Becker, Estrada and Freeman, 2014);

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[3] The definition of a 'learning environment' often refers to the social, psychological or conceptual environment rather than to the physical (B. W. Cleveland, 2011). There is however an increased interest on the role of space in educational settings.

- The changing role of the library and resource specialist (Streatfield & Markless, 1994);
- Linking culture, pedagogy, ICT and space.

Learners

- Student cohort characteristics, such as those defined by SES, Indigenous needs and internationalisation of the classrooms;
- Teachers as learners;
- The type and intensity of relationships that are encouraged at all levels – for example, the student-student, student-teacher, student-community, student-executive, teacher-teacher;
- Spatial implications for special educational needs including and also extending the concept of inclusivity (Department for Education, 2005);
- How people learn (Bransford, 2000).

Learning Community

- Sense of place;
- Involvement in the process of design and of evaluation (The-World-Bank-Group, 2014);
- Opportunities and constraints created by the role of the school in the community, and of the community in the school.

Learning Environment

- The whole campus is a learning space;
- The (arguable) decline of the classroom;
- The use of the outdoors as learning spaces, creating a more holistic view of the learner and her/his association with the campus;
- Sustainability as a tool for design and for learning;
- Linking culture, pedagogy, ICT and space, in the process embracing a broader concept of educational technologies;
- Furniture and fittings.

This is a complex task to accomplish. While the needs outlined above are clear, as yet there is little rigorous evidence attesting to which physical learning environments are the more appropriate to support contemporary pedagogies in this digital and knowledge age. Not only are 'new' skills being demanded of the modern day graduate, pedagogies are in a state of flux, and ICT is evolving at a seeming expediential rate. Unprecedented pressure is being placed on the educational system, and by association, on the designers of spaces where this activity is largely housed. The ESP must remain cognisant of these continual changes in the educational and learning landscape, and take leadership in effecting the required changes in established thinking.

5. The ESP must utilize an evidence-based strategy for facility development. While 21st century learning remains conjecture to some degree, ESPs must accept the probability such an aspiration will become established 'normal' practice well within the life-span of the spaces they assist in designing. This 'catering for future need' is one measure of the success of a ESPs professional activity. Many educational institutions and governing bodies are keen to have evidence about the performance of new learning environments before they embark on expensive new builds or major refurbishment. This demands an evidence base that ESPs must assist in creating. While most in education are hoping for increased student engagement and performance from future designs, many are also looking at the potential impact of these environments on the development of 21st Century Skills such as collaboration, creativity and entrepreneurship. This need for evidence calls for the development of tools for measuring the performance of educational environments within the context of particular educational models.

6. The ESP must successfully incorporate the well-established working processes of a range of disciplines into a successful project development. There are different stages to the architectural design process, and each state, region or country has differing approaches. The diagram below illustrates but one. It describes a comprehensive process, with each stage of the design process supported by both architectural and educational planning activities:
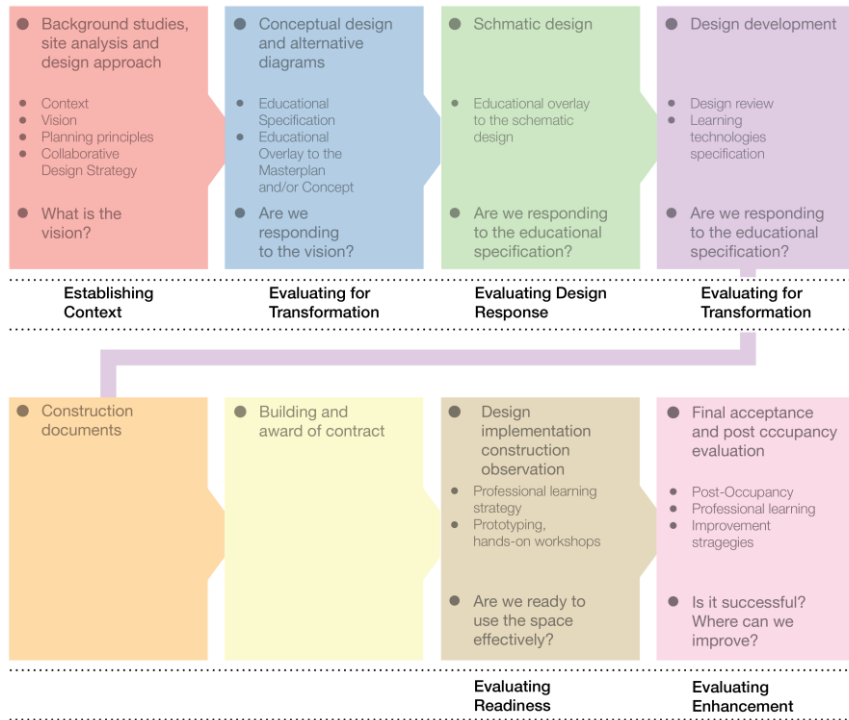
Educational Planning Design Process and Evaluation

Background studies, site analysis and design approach	Conceptual design and alternative diagrams	Schmatic design	Design development
• Context • Vision • Planning principles • Collaborative Design Strategy	• Educational Specification • Educational Overlay to the Masterplan and/or Concept	• Educational overlay to the schematic design	• Design review • Learning technologies specification
• What is the vision?	• Are we responding to the vision?	• Are we responding to the educational specification?	• Are we responding to the educational specification?
Establishing Context	**Evaluating for Transformation**	**Evaluating Design Response**	**Evaluating for Transformation**

Construction documents	Building and award of contract	Design implementation construction observation	Final acceptance and post cccupancy evaluation
		• Professional learning strategy • Prototyping, hands-on workshops	• Post-Occupancy • Professional learning • Improvement stragegies
		• Are we ready to use the space effectively?	• Is it successful? Where can we improve?
		Evaluating Readiness	**Evaluating Enhancement**

Figure 1: ESPs within the design process (adapted from Site Planning and Landscape Architecture Design Process; http://designhome.pics/)

Phase one encompasses the pre-design process where evaluation of existing facilities establishes an educational context for the new design. It addresses the question, "What is effective and what is important?"

Phase two relates to the concept and schematic design processes, and addresses the question, "How will the new space be used and how is it expected it will work?"

Phase three uses evaluation to determine the design's response to the needs expressed in the previous stages. It can occur after the design is completed and during the construction phase. It reviews the previous phases to ascertain the learning community's readiness to occupy the new spaces. It asks the question, "How do habitué intend to occupy this space"?

Phase four encompasses the build's post occupancy evaluation, and addresses the question "Is the design, and resulting space, 'successful' and is it sufficient?"

7. The ESP must be an evaluator. Good ESP practice is iterative practice, each exercise informing the next, and each project adding to a knowledge base for future projects. Such iterative practice accommodates the complex variables represented in the educational sector, and the absence of any 'grad narrative' across all school designs. As in education where the 'reflective and reflexive practitioner' utilises evidence to improve teaching in a complex array of scenarios and over time, the ESP likewise utilises all evidence to develop and record a repertoire of knowledge that can be applied in particular circumstances. In this way, evaluation serves as a mechanism for ongoing improvement and for planning future change.

8. The ESP has responsibilities beyond occupation. A criticism of traditional architectural practice is that designs are often treated as complete once keys have been exchanged (Clarke, 1999). However, people rarely occupy buildings as envisaged by the designer, and once in occupation they modify their surroundings to suit changing needs over time (Brand, 1994). The good ESP must provide services well beyond occupation, into that period described as 'inhabitation' where the habitué alter their practices to suit their surroundings, and conversely reconceptualise spaces to suit their particular physical and intellectual needs. Such services include ongoing evaluation of the space against baseline data collected during Phases One to Four, described previously.

THE CRITICAL NEEED FOR CONCEPTUALISING THE EDUCATIONAL SPACE PLANNER AS AN EVALUATOR

The previous section summarised the tasks that define good ESP practise and the principles ESPs should address to play a meaningful role in the planning and inhabitation of a new school building. The eight criteria indicate that the ESPs role is unique and, some would argue, critical to the long-term educational success of a new educational facility. Yet little attention has been given to evaluating the impact of these specialists, in particular their potential for ongoing development of new age educational design and use. Little attention has been given to the unique position the ESP owns in terms of utilizing their in-practice ongoing evaluations to inform superior design and use of new age learning environments. It is at this critical juncture that urgent research is required.

What should such research cover? It should fully document the role of the ESP and in the process determine in what ways she or he acts as an ongoing evaluator, enhancing the efficacy of learning environments designed to support 21st century pedagogies and skills. The research should document the ESPs role in identifying alignments and misalignments between desired pedagogical practice and educational objectives, the intended relationships facilitated, the affective influences and the user's behaviours as well as the learning outcomes, and the support the learning environment it provides to achieve all of these. The research should focus in particular on how the actions of an ESP informs not only the design of learning spaces from a pedagogical perspective, but also serve to establish baseline data for end-users as they occupy the building in the short term, then adjust and manipulate these spaces and practices within, over a long period. The latter action is termed 'inhabitation' (Imms, 2015).

Such research would investigate how the ESPs actions constitute an iterative, integral part of the design process. It would seek to understand if the ESP's actions could be viewed as 'applied developmental evaluation' - an evaluation for improvement before and during the design process, as well as after the building is occupied.

The research should examine how the ESP might be seen to act as an ongoing evaluator, utilising evidence to articulate core pedagogical, curriculum and organisational principles to be acknowledged by the design, and from this platform defining the programmatic, functional, spatial, and environmental requirements of the educational facility, whether existing, new or remodelled.

THE ROLE OF EVALUATION IN ESP'S PRACTICE: A SUGGESTED RESEARCH APPROACH

As suggested above, a broad interpretation of evaluation underpins the actions of the ESP. It represents a much more complex view of 'evaluation' than is perhaps currently in use. In addressing this issue, the E21LE research team identifies evaluation as traditionally being interpreted as the action of 'determining the value or worth of a program' (Cleveland, 2015). This understandable but somewhat restrictive interpretation does not necessarily service the broad range of *needs and purposes* being addressed by the ESP and required by teachers, designers and policy personnel intent on maximising the effectiveness of modern learning environments. In response, the proposed evaluation framework developed by Cleveland and Imms (2015) distributes existing and emerging evaluation strategies across a matrix that allows 'users' to develop bespoke evaluations according to their school's particular requirements. This approach arguably overcomes to some degree the exclusive, specialist-only assumptions previously attached to assessing the value and impact of new and existing learning environments. To carry this point further, the argument of this chapter is that the ESP occupies a position to facilitate these types of ongoing, iterative and generative evaluations. It is this issue that requires immediate examination.

Such research should maximise work already done in this field, and then use emerging knowledge to direct research addressing gaps in ESP's existing practice. It must formalise this approach within a theoretical framework that builds robust evidence, effectively scaffolding future developments. As an outcome it must provide a cohesive model of the interaction between ESP practice and ongoing evaluation. In brief, research is needed to consolidate what is known, theorise how this does and should contribute to scholarly knowledge of ESP practices, and establish protocols for future ESP practices.

What questions, then, should drive such research?

Issues

The critical concept to be examined is how evaluation constitutes a vital element of educational space planning practices. This suggests a wide range of issues must be explored, for example:

– What are the evaluation tools at the ESPs disposal?
– To what extent and in which ways are these evaluation tools currently used to assist the educational space planning process?
– Which evaluation tools are 'missing'?
– To what degree can an ESP use evaluation strategies to impart and impact change? How can ESPs use evaluation tools to enhance practice, align learning environments to educational imperatives, better use resources, and identify risk?
– How do ESPs know if the KPIs and questions in an evaluation tool are the right ones? That is, how do ESPs evaluate an evaluation?
– What are the circumstances that affect a learning environments evaluation tool's effectiveness?
– How, when, by whom, on whom should evaluation be done?
– What is the role of the learning community, the financial and political overseers and stakeholders in this evaluation process, and how should ESPs most effectively enlist their support in an evaluation?

THEORIES THAT INFORM ESPS PRACTISE: AN EMERGING METHODOLOGY

The unique blend of architectural and educational theory that underpins such a line of enquiry is complex. Research into this phenomenon should follow the ontological position of constructivism. Constructivism asserts that social phenomena and their meanings are continually being produced by social interaction and are in a constant state of revision: they are socially constructed. It should also follow constructivist perspectives on learning and teaching. These are considered effective because of the holistic manner in which they are able to link theories of learning, motivation and development from the child's perspective, with emphasis on the active role of the learner in building personal meaning and in making sense of information (McInerney, 2010). According to Angela O'Donnell and colleagues (O'Donnell, Reeve, & Smith, 2009), constructivism describes how a learner constructs knowledge via different concepts: complex cognition, scaffolding, vicarious experiences, modelling, and observational learning. This makes students, teachers, the environment, and anyone or anything else in which the student has interaction, active participants in their learning. In the suggested research, these theories would acknowledge the reflexive and reflective nature of the modern teaching and learning space, and would provide a student/teacher centred framework for constructing measures of effectiveness and impact of the learning space.

An exploration of place theory would help in the understanding of what gives identity to or a 'sense' of space/place including a sense of belonging - a crucial factor in the evaluation of a learning environment (Dovey, 2010).

These positions on learning and place/space should be influenced by theories relating to the socio-material, in which relationships are enabled and fostered by space (Dovey, 2010), technology, texts, human bodies, intentions, concepts, nature and objects of all kinds, including 'objects of knowledge' (Fenwick, 2010). These theories argue the inhabitation of space goes from being separate to the physical body, to being a part of the user's day-to-day relationships (Mulcahy et al., 2015), helping reveal the dynamics of everyday life, which clearly includes learning.

Similarly, assemblage theory contemplates the concept of continuous change, but broadens its scope to include the inherent continuous change that comes from dealing with people as part of a system. It explores the idea of the complex relationships existing between social change and social networks and how these are seen as dynamic, adaptive, fluid and an ongoing process of emergence and becoming (Deleuze, Massumi, & Guattari, 2008). In complex systems theory, a series of dynamic, nonlinear interactions produce 'emergence' (Davis & Sumara, 2006), the understanding that in (complex adaptive) systems, phenomena, events and actors are mutually dependent, mutually constitutive, and actually emerge together in dynamic structures. Actor-network theory looks at how entities, human and nonhuman, come together and connect, changing one another to form links that bring forth networks of coordinated action and things (Fenwick, 2010). These theories help 'offer an alternative to the linear, reductionist approaches to inquiry that have dominated the sciences for hundreds of years and educational research for more than a century'(Davis & Sumara, 2006).

Evaluation theory, in particular developmental evaluation, offers a framework that accommodates complex non-linear systems (such as a learning environment), and enables a continuous process of development, adaptation and experimentation using the results of the evaluation (Patton, 2005). Positive psychology focuses on the strengths, virtues, beneficial conditions and processes that contribute to well-being and positive functioning (Luthans, 2002; Norrish, 2013; Rusk & Waters, 2013; Seligman & Csikszentmihalyi, 2000). Appreciative inquiry involves the art and practice of asking questions that strengthen a system's capacity to apprehend, anticipate, and heighten positive potential (Cooperrider, Stavros, & Whitney, 2008 2008, p.3). These three concepts help guide the development of questions and approaches used when interviewing ESPs and users of the spaces, in order to improve practice, relationships, and outcomes by focusing on what is already working well. Strategies derived from citizenship engagement and social accountability will support effective consultation. The former refers to users' active participation in the development of knowledge in a formative and collaborative manner, one that has a positive outcome for the learning community; and the later, describes the extent and capability of citizens to hold the 'state' accountable and make it responsive to their needs (The-World-Bank-Group, 2014).
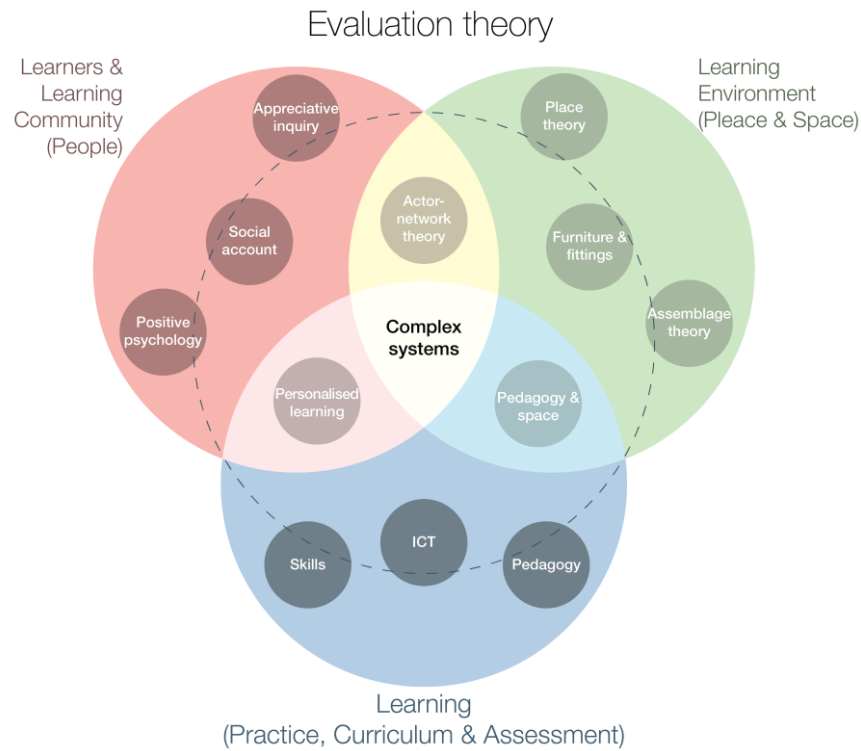
Evaluation theory

Learners &
Learning
Community
(People)

Appreciative
inquiry

Social
account

Positive
psychology

Actor-
network
theory

Complex
systems

Personalised
learning

Learning
Environment
(Pleace & Space)

Place
theory

Furniture &
fittings

Assemblage
theory

Pedagogy &
space

ICT

Skills

Pedagogy

Learning
(Practice, Curriculum & Assessment)

*Figure 2: Summary and organisation of key theories pertinent to an examination of the role
of evaluation in an ESPs practise (Sala-Oviedo, 2015)*

Figure 2 organises these complex theories into a cohesive methodological framework that includes 'people', 'place and space', and 'practice'. In the process key themes emerge, represented by the 'four Ls', that is Learners, the Learning Community, the Learning Environment, and actual Learning. These themes neatly summarise the eight core functions of the ESP's practise, described previously. Within this conceptual structure, a robust and informative examination of an ESPs practise can be organised. How should this research actually be structured and carried out?

IMPLEMENTING RESEARCH THAT EXAMINES ESPs PRACTISE: AN EMERGING METHOD

A suggested design

For the range of issues described previously, a mixed method research design should be utilised. Researching the use of evaluation to inform educational space planning practices across the 'four Ls', by default also examines the alignment of key affective domain practices such as the context of a build, the strategic and educational aspirations of the build, the actual performance of the build, and the relational and behavioural paradigms that impact the build and its eventual use. These orientations to the research can only be approached through a design that accommodates rich understandings of actual practices. Action research is one approach that will achieve this aim, where "the researcher and the members of a social setting (a school) collaborate in the diagnosis of a problem and in the development of a solution based on the diagnosis" (Bryman, 2012, p. 397) A case study approach is a second method. While case studies are a research design that entails the detailed and intensive analysis of a single case, it can be extended to include multiple sites for comparative purposes (Bryman, 2012). A combined action research and case study approach should allow a flexible inter-disciplinary .approach to the research, depending as it does on philosophies, methods and knowledge particular to the disciplines of education and architecture.

A three-phase study is required to allow a logical development of knowledge from what is already known through to creation of new understandings about this aspect of ESP's practise. The first phase should establish an evidence base of existing evaluation practices of ESPs. The second phase should comprise field work that (1) extends and refines these existing evaluation practices; (2) develops new evaluation practices to fill gaps in the conceptual framework illustrated in Figure 2; and (3) from this work creates a framework of tools for different contexts and objectives. The third phase should evaluate the efficacy of this framework by pilot studies in a variety of schools. This final phase should utilise the approach illustrated in Figure 3 to structure analysis and to guide documentation of findings.

Using the structure illustrated in Figure 3 as a theoretical guide, the results of this research should be documented in a mix of written and graphic forms, in an iterative manner, to allow for review and clarification with participants in the research. This should ensure that the specific requirements of each community are accommodated, and should suggest possible next steps to better align ESP practice and organisation with the spaces and the intended outcomes, including giving specific professional learning initiatives.

Some caveats to this suggested design exist. Exploring how ESPs utilise evaluation as a tool is a challenge, and its success mitigated by how well it attends to the following issues:

What constitutes evidence?

Evidence-based design for learning spaces, while not necessarily a new thing, is not that well established in terms of quantitative research or in particular in its evaluative component. While there is plenty of research that supports (for example) a shift towards collaborative and personalised approaches to learning, the research around the spaces that support this is far from extensive, often contradictory and highly contextual. A literature and research review will seek to establish some clear and commonly accepted principles in relation to the evaluation of the effectiveness of learning spaces, but the remainder of this project will be guided by action research, case studies, consultation with identified stakeholders and educated assumptions around how the learning communities' aspirations are best supported.

What is the context for evaluation?

The same way that architecture should refer to the context where it sits (or otherwise make a point of not doing so, but cannot remain indifferent), it is most probable that the same set of tools for evaluation will not be able to be used for all learning communities (The-World-Bank-Group, 2014). Different evaluation tools will be needed for different learning communities, at different stages of design and for different respondents.

How to maintain the research as an inclusive process?

It is hard for many school communities to understand the relevance of a 'different' space. Change is seen as a threat and as a source of additional work, and it is so. This is why it is crucial to be able to communicate effectively why the space is being considered or why it has already been done, and how it can benefit them to be able to support their practice and make the most effective use of the resources, both physical and human.

How to remain genuinely consultative?

To a certain extent it is envisioned that the evaluative process will become an integral part of the inclusion of the learning community within the design process. Community participation is a key element in the success of the establishment of any change or innovation (Gaventa & Barrett, 2012). It will be necessary to identify key stakeholders for consultation throughout the life of the project in order to ascertain how well the tools are working to support this idea. The inclusion of appreciative enquiry as a leading theory behind the evaluation tools, as well as the use of rigorous questionnaire and interview design principles will help ensure that consultation remains relevant and that results can be used for formative and comparative purposes.

How to adhere to a formative process?

It is important to ensure that the results are not only useful for the research but also relevant to each school in that they can learn from the process and identify opportunities for change. A positive/appreciative inquiry approach to evaluation in which once we understand the context, we can build on the positives instead of just 'fixing' what is not working, seems to be the most relevant evaluation for this context, as it also supports change management practices.

What is the most effective mechanism for disseminating results?

It is likely that the final format of delivery will involve online, digital and printed elements. This will require discussion around points of access by the learning communities. The distribution of material will also require a degree of strategic planning in regard to equitable distribution and ensuring the material is accurately interpreted. Solutions to the latter include access to online instructional videos, the use of consultation to discuss ease of use, and perhaps the offer of professional learning opportunities.

How can the research remain relevant to the practitioner?

One of the risks associated with evaluation of learning environments is that the inexperienced user may not have the skills, knowledge or confidence to interpret the questions they are being asked or the application within their unique learning and/or design context. The inclusion of relevant information will be critical in getting users to engage with the evaluation and ensure the outcomes are relevant for the study.

How can the research maintain coherence?

It is envisioned that a range of tools will be required to accommodate different contexts. While the final number of tools is undetermined, it is likely that there will be quite a few. Legibility of the final series will be critical. Clear connections between the evaluation and its purpose, simple and aesthetically pleasing graphic design, user-friendly access and clear guides for application will be critical

How can the research protect the temporal aspects of its findings?

Learners and learning in the 21st century are continually affected by change. Rapid developments in technology will continue to affect teaching and learning and the settings used to support it. It will be important to consider how project outputs will remain responsive to change and implement a plan for cyclical evaluation, review and revision.

CONCLUSION

Within educational institutions, and in particular within schools, there is a general lack of understanding regarding the links between pedagogical practice and space, and the learning and teaching opportunities that this relationship presents. While many educational institutions and educators know that these are important, most do not really know in which manner or how to assess this impact, and use the opportunities presented by these links to maximize learning outcomes, promote positive behaviours and relationships, and improve well-being.

As yet there is little rigorous evidence attesting to the efficacy of which learning environments are the more appropriate for 21st century pedagogy, in a fast changing digital and knowledge age. It is therefore very hard to provide evidence-based guidance to learning communities on the assemblage of spaces that will best support their educational imperatives.

Another key issue is the natural resistance that we have to change and how to facilitate this without leaving members of the educational community behind. Buy-in from the whole community (as far as possible) is necessary for success.

The approach to evaluation suggested in this chapter, and its focus on the special situation of the ESP, provides an opportunity for the development of a unique evaluation framework, one that could be designed as a series of 'reflective' tools to help learning communities (leaders, teachers and students) reflect on the interaction of the school's culture, the educational programs, pedagogical practices and the use of physical spaces. As such, the evaluation would be a formative and participative evaluation framework that should have enough rigour to be also a research tool.

The type of research presented in this chapter would have the following impact. It would identify major successes and failures in the design of physical learning environments and examine the possible interventions to solve problems. It would provide insights into how effectively the learning environments are being used and understand the problem areas. It would help determine teachers' spatial competencies and identify the areas that need to be improved through professional development strategies.

In the process of achieving those three outcomes, it would provide guidance on the planning of new learning environments, and provide learning communities with a tool to determine where they are in terms of pedagogy and space alignment and enable discussion for future practice and/or space interventions

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