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ASSOCIATION OF RESEARCHERS IN **CONSTRUCTION MANAGEMENT**

THIRTY-SIXTH ANNUAL CONFERENCE 2020

September 7-8

Working Papers

Foreword

Welcome from the Chair of ARCOM 2020

Professor Lloyd Scott, Technological University Dublin

As we began to roll out the early stage planning for the 36th Annual ARCOM CONFERENCE, the world came face to face with the unprecedented challenges of the COVID-19 pandemic. While the immediate global priority remains to tackle this public health emergency, society's long-term response must also address the underlying causes of such a pandemic and certainly the ARCOM community can make a strong contribution to this.

So, with the COVID-19 restrictions and the speed with which the pandemic took hold, the conference organising committee were left with a decision, back in early April, whether or not to hold the conference and if so what type of conference might it be. The shared consensus was that some form of conference needed to be had. After all, it might be said, spread around the world, the ARCOM community should come together and move forward with 'the common good'. We hope, indeed expect, that an effective vaccine will be developed quickly but, in the meantime, we are left to our own resources and virtual it is for this year. So, I am humbled to welcome you to the first ever virtual ARCOM conference.

This year's conference attracted 294 submissions in January 2020. Following three rounds of double-blind peer-review, a total of 110 papers were eventually accepted for presentation at the conference. In a field that is now saturated with so many international conferences, this success rate demonstrates the rigour applied to the ARCOM peer-review process. Of course, this cannot be achieved without the support of 110 reviewers drawn from across the world, including 21 ARCOM Committee members and 78 members of the extended Scientific Committee. Thank you to all involved in the peer-review process.

This is the fourth year in which the ARCOM Conference has been themed. There were also eight thematic tracks proposed for the conference, covering a range of issues from community engagement to the tyranny of metrics and including sustainable entrepreneurship in construction and building for the common good. These thematic tracks now form an important part of shaping the papers received and accepted and, we hope, of steering the discourse at the conference. Another significant area in this year's conference is the focus on sustainability in the built environment, where authors address questions around low energy and low carbon construction along with governance and the common good in construction.

It is also very encouraging to see authors becoming more engaged about the position and research that addresses construction education. The construction management community of researchers can be seen to mature and expand their research activity within the fast changing environment in which society finds itself and particularly the emerging aspects/ impacts of COVID-19. The opening plenary session appropriately focuses on addressing the common good in the context of sustainable cities where two keynote addresses - the first by Professor Ann Bradley from the Construction Leadership Council and the second from our own Dr. Alex Opoku - will be provoking us to think about the role of the AECO in addressing the climate change agenda.

The second plenary session chaired by Dr Craig Thomson with keynote addresses by Professor Martin Loosemore and Dr. Ani Raiden addresses the topic of "The rise of

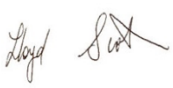
Social Value within the Construction Industry: the Challenges and Opportunities presented by COVID-19". The session will include a contribution from Mr. Dave Higgon from Multiplex Australia as a discussant. It gives me great pleasure to introduce this year's Langford Spotlight where the topic of "The Politics of Construction" is explored by Ms. Chrissi McCarthy, chaired by Dr Vivien Chow. It promises to be a lively session and one that David Langford would be very proud of.

The virtual setting allows for the exploration of three one hour workshops where three distinct topics cater for the divergent needs of the ARCOM community. Construction 4.0 is explored by Professor Paul Chan while Dr. Nicola Callaghan leads the session on research methodology exploring what Grounded Theory is or even is not. The third workshops looks at mental health and wellbeing in the COVID-19 world in which we are now all living. ARCOM chairman, Professor Chris Gorse explores this important topic with some personal reflections. I am delighted to also add to the discourse in this workshop.

ARCOM continues to attract an international audience, and we have delegates joining us this year from, inter alia, Europe (with colleagues from the Netherlands and across Scandinavia), the United States of America, South Africa, Sri Lanka, India, China, Malaysia, Australia and New Zealand. It is good to welcome colleagues from both developed and emerging economies alike. Following the successful 'Meet the Editors' session back in ARCOM 2017, we will run this session again at the virtual ARCOM 2020 Conference. Gemma Hemming from Emerald and Ed Needle from Taylor and Francis have teamed up and planned a very interactive session on day two. They will discuss what post COVID19 in the field of construction management research may look like.

Lastly, but not least, I also wish to express my sincere appreciation to a number of key individuals for their support and help over this past year; the ARCOM Committee, Cath O'Connell, Rosalind Oxley and Katie Clements, all the folk who helped us at iVent, and of course, this conference would not have been possible without the relentless and unwavering efforts of our conference secretary, Chris Neilson. I would like to finally thank ARCOM chairman, Professor Chris Gorse, who has been a rock of support to me in navigating my new experience.

Welcome to ARCOM 2020 and to the virtual experience. Enjoy!



Lloyd Scott
Conference Chair, ARCOM 2020

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The success of the Annual ARCOM Conference depends on the voluntary efforts of the members of both the ARCOM Committee and our international Scientific Committee. We are indebted to the members of both commitees who together provided rigour and constructive feedback in the peer-review process.

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ARCHITECTURAL RESEARCH AS AN AUTOPOIETIC SYSTEM: SHIFTING THE FOCUS FROM ACTORS AND IDENTITIES TO SYSTEMS

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This research describes and examines how an association of small Australian architects undertook a self-initiated research project. This project involved a collaboration between the association, represented through its governing board and a university researcher. The group of architects developed a project that asked if architect-designed house renovations improved capital gains in an inner-city property market. This research question was the result of concerned within the group of how its members could better communicate to their potential client base. Hence, the group sought quantitative research that would act to shape public narratives about the value of architects. Notably, the study was funded through an innovative crowdfunding arrangement. Consequently, the research process itself became more interesting in its own right and reflecting on it indicates how architect's approach and think about research methodologies and methods. A limited literature review of prevailing design as research and professional identity research is presented. Employing an ethnographic method, the way the community of architects formulated, developed, implemented and analysed the research project is described. By employing an Autopoietic framework the architectural association can be described as a self-organising system shaped by design thinking. Architects need to abandon the idea that research is akin to design thinking and understand that research is not necessarily a creative design pilgrimage in search of idealised solutions.

Keywords: Architects, research, design research, professional identity, autopoiesis

INTRODUCTION

This study investigates how a professional architect's organisation of 750 architects undertook a quantitative research project. This organisation was seeking information that would reinforce, to potential residential clients, the value of using an architect. It was seeking an answer to the question: "Do small practice architect designed renovations improve capital gains in the Melbourne residential property market?" This project was a contracted research collaboration between the architectural cooperative (AC), the AC's board (ACB) who governed the project and the principal researcher (R1), an academic based with the University Partner (UP). Other actors were the, two AC members who championed the research (CH1, CH2), and a research assistant (R1). At first glance, this project appears to depart from standard conventions of what a research project should be. Firstly, the project was initiated by a community of architects rather than a university or research institution. Secondly, funding for the

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research was sourced through a public crowdfunding campaign, and the UP did not contribute funds (but only in-kind time) to the study. Thirdly for the AC and its board the aim was to derive outcomes that might shape ongoing professional advocacy and policy campaigns of the ACB.

Research Aims and Questions

The above elements point to how the ACB's research project, from the outset, had a different epistemological context, compared to research that might ordinarily be undertaken in an academic framework. Consequently, the focus of this study is to understand, through ethnographic methods, how the project was conducted by the community of architects. In other words, the general aim herein is on how the architects went about the project and identify any shared professional beliefs, understandings and norms as the project proceeded. This focus should not be conflated or confused with findings of the AC's actual research project itself. The specific research question herein was to ask: What were the norms that guided the architects as they self-initiated a particular research project?

Background to the AC's Research Project

The Architectural Cooperative (AC) sponsoring the research was founded in 1991 and is comprised of very small practices. The organisation is run by a board (ACB), elected from its 750 members and describes itself as "the leading dedicated voice of Australia's small architectural practices." The AC's research project was instigated in response by the group, in its own words with the aim of "lifting the fog around what architects actually do and our relevance today." The research was self-initiated by the AC and was the first-time architectural research had been crowdfunded in Australia. It was the AC's first research project.

LITERATURE REVIEW

In studies of the architectural profession, several prevailing concepts around the way research in the profession has been both approached can be identified. In place of a more extensive literature study, a limited discussion of two trajectories is presented here. The first trajectory is what architects themselves have called "Design as Research." And the second trajectory is related to studies of professional identity in architectural practice.

The first trajectory emerges from the Design as Research debates of the early 2000s, triggered by the advent of the RAE. At that point architects in the UK were keen to establish that their activities counted in university research metrics. In these debates, Lawson (2002) argued that it was primarily in the architectural design studio where architects generated new research knowledge. He claimed the RAE definition of research as "original investigation undertaken to gain knowledge and understanding" was aligned with the "design as research paradigm." These ideas appear to extend Winch's (1998) model that architectural design embodies a conjectural design approach, where an initial conjecture is proposed and then followed through via several iterations. Rendall (2004) also fostered the idea of design as research stating that academic research should not merely be "an incubator for innovations in architectural design that will improve the quality of the built environment." Instead, she argued that architects needed to pursue research that was both exploratory, self-reflective and propositional (Rendall, 2004). As the debate evolved, Roberts (2007), examined the link between academic research and architectural design studio teaching. He reinforced the ambiguity around the issue by concluding "there is no

single specific research methodology that might typically be used." Going to say, "architecture utilises and applies the methods and knowledge base of other discipline areas, including the human and physical sciences, the humanities and the fine and applied arts."

For architects, perhaps unlike other professions, the boundary between research and practice is not clear. Nevertheless, for architects, the architectural design process itself is central to creating new knowledge in architecture. Writing in 2017 Megahed summarised the earlier RAE debates by arguing they "reflected uncertainties" about architectural research "in both practice and academic culture at that time" Megahed (2017) and claiming that design as research had gained maturity in architectural academia. He concluded that for architects "Design research in architecture is commonly labelled research by design, research by creative practice, research through design, practice-led research, and practice-based research." But also, that it was "original investigation set out for the purpose of gaining new knowledge by means of practice and its creative outcomes" Megahed (2017). As Raisbeck (2019) notes, the predominant research paradigm in architecture has been this focus on design as research.

In the second trajectory, Renier *et al.,* (2010) employ Winch's model as a departure point to argue that architects have two different modes of design thinking (Winch 1998). One mode is based on design problem-solving, and the other is based on the "generation of new ideas as a result of changes in broader market conditions" (Renier *et al.,* 2010). This claim points to a creative design vs. business binary evident in numerous studies of architects (Styhre and Gluch, 2009; Manzoni and Volker, 2017). For example, Bos-de Vos and Volker (2017), in a comprehensive series of published research, identify how architects have a strong professional creative ethos and they explore this by researching the "micro-actions" of different individuals in architectural settings. Bos-de Vos *et al.,* (2019) also posit that identity conflicts, between business and creative identity strategies, can be resolved by architects through a value conflict model. This model has also given rise to examining how architects operate as actors across boundaries and inter-organisational project contexts (Bos-de Vos *et al.,* 2019).

In related research, there is an evident effort to bridge the gap between how architects think about academic research, creative design business practice and professional identity. Lee and Moore (2017) in a bibliometrics study of published architectural research between 1995 and 2016, highlight an accelerated alienation of academic research from practice. Ahuja *et al.,* (2017), in an ethnographic study of architects, argue that architectural identity is problematic in the clash between design aesthetics and professional practice. Moreover, Samuel (2018) claims that architects need to see the link between creative expression and the legal and business frameworks of the architectural profession as being integrated. To make this shift, she argues that architectural research should be the result of a co-production between architects, academia and clients. Also pursuing the concept of professional identity, Ahuja *et al.,* (2020) explore how architects constitute their identity in interactions with clients, noting that more research is needed with "sociologically informed theorising on identity issues in construction management research" (Ahuja *et al.,* 2020).

These above debates in architecture regarding design research have had a methodological focus on discrete actors of various kinds: Clients, academics and designers. It is not surprising, that with this atomistic focus professional identity emerges as an area of research in the field. In turn leading to a research emphasis on

various factual binaries, such as academia vs practice and creative architect vs business architect.

Why Autopoiesis?

The architect Patrick Schumacher has argued architecture is an autopoietic system. He argues that "architecture be most adequately grasped if it is analysed as autonomous network (autopoietic system) of communications" Schumacher (2010). An autopoietic system is a closed system that determines and sets its own organisational rules; creating its own boundaries, and its internal dynamics and structures are self-generated. This perspective allows an understanding of the internal dynamics of the AC as they went about their research project rather than adopting a focus on actors. Autopoiesis suggests professions can be understood as systems and need not be regarded as bounded groups of actors "engaged in collecting, organising, and operating upon "facts" from the environment" (King, 1993). While it may go without saying, this paper pursues the suggestion of Ahuja *et al.,* (2020) by employing an autopoietic framework as "sociologically informed theorising."

Autopoiesis emerged as a concept in the biological sciences and has a legacy in systems theory and cybernetics (Varela, Maturana and Uribe, 1974). While autopoiesis has its origins in the biological sciences, Luhmann reformulated the theory for the social sciences. (Maturana and Varela, 1980. Luhmann, 1987). Luhmann (1987) posited that it was a theory that views communication as the basic component of social systems. This emphasis has been the main focus herein. As Maturana and Varela (1987) highlight "An autopoietic system is structurally determined, meaning that change in structure is determined by the unity even if triggered by the environment; the unity determines how it responds to a trigger." In the social sciences, autopoiesis has been explored in a range of settings. Turpin (2017) use autopoiesis as a way to understand two different systems in rural South Africa. Åkerstrøm and Stenner (2019) employ Lohmann's theories to theorise discourses of management centred on "potentialising technologies"; technologies related to the mantras like "the future of the future." Autopoiesis, as a framework allowed the AC's research project to be analysed via the way the AC reacted to its external context and implemented the project as the project proceeded. This primary focus of this lens was to examine the AC as a system pf communication.

METHODS

A qualitative and rapid auto-ethnographic method was employed to observe and gather data throughout the AC's research project. Again, it is worth noting that the case study reported here should not be conflated with the results of the AC's actual research project. During the project R1 acted as an embedded researcher recording and observing how the AC went about the project. The ethnographic methods adopted were "holistic, descriptive and reflective in nature" and R1 was able to "capture the social meanings and ordinary activities of people in their natural settings." Moreover, for R1 this case study was, "seen as a reflexive and subjective practice within which the researcher is expected to contribute or participate" (Loosemore *et al.,* 2010, Pink *et al.,* 2012). In self-reflexively undertaking this role, R1 bought to bear considerable experience in both qualitative and quantitative research, architectural practice and design studio teaching.

The method involved R1 collecting data, through emails, meeting notes and documenting the iterations of the project as the project proceeded. As the AC's

project continued, R1 sought to conceptualise how and explain why the project was undertaken in the way that it was by the AC. This auto-ethnographic approach allowed R1 to reflect on self-reflexively, and inductively assess any emerging ideas about how the AC went about the project. As set out below a principal guiding structure for data collection and analysis was the different phases that the project underwent. Once autopoiesis emerged as a working theory (toward the end of the survey analysis phase), the project was tested against the idea that it was a self-organising system of communication. Each phase was examined, as a system of communication, by asking what was said, or asked, within this phase? Can the AC be described as a system?

Description of the AC's research project

Overview and Project Formation
At the early stage of project formation, the AC's advocacy group had explored and noted a series of potential research topics and questions. These included: What are the common legal pitfalls that affect architects in small practice? What is the profile of people who use architects? Why don't people use architects? What is the most profitable business model for architects? How do imports meet Australian Standards? The project was then formed through a series of ad-hoc and informal meetings that took place between R1, CH1 and CH2, the members of the advocacy working group.

Method Formulation
In May 2017 a draft memorandum of understanding was formulated by R1 and circulated with the ACB and a UP research officer. At that point in time, the research method was set and described as " a descriptive comparative quantitative analysis of two data pools. One pool will be based on sale data from architect-designed houses, and the other will contain sale data from non-architect designed houses. The data from each of these pools will be aggregated, then analysed and compared."

It was posited to the ACB that this approach was a quantitative and the analytical method not reliant on "statistically significant" sample sizes to draw conclusions. This was simply a data gathering exercise. The first of these data pools were to be gained from the AC's member architects using a data-gathering survey and then corroborated in an Australian property database. This quantitative method had been used by R1 in a previous research project focused on infrastructure projects. The previous study also employed an aggregated and pooled method, had been published and widely cited (Raisbeck et al. 2010)

Development of the Research Question
In July 2017, the ACB met, and refined the research question to ask: "Do architect designed renovations improve capital gains in the Melbourne residential property market?" But also going on to ask R1 for advice on to how best define terms such as "renovation" and "Melbourne residential property market." The AC indicated that the word "renovation" should be described as a value (e.g. between $250,000 and $1,000,000), or "as a percentage of the original capital value of the home, or other system." The AC suggested that the "Melbourne residential property market is presumably defined as within a certain distance from the CBD," going on to assert that the research look at single dwellings, rather than apartments. Despite these suggestions about research scope, the ACB also stated: "Should R1 wish to suggest any finessing to the wording of the question, please do so."

In July 2017 it was envisaged that the project would start asap, subject to AC and the UP drawing up an agreement whereby R1 would conduct the research for the AC. At

this point, the initial time program was envisaged to be as follows: Weeks 1-4 Data Collection 75 hours, Weeks 4- 8 Analysis 75 hours, Weeks 8- 10 50 hours.

In May 2018, after the research funding contract had been finalised, which included details of the agreed method to be employed, one ACB member questioned the research method. These questions were threefold: If the propose data pool was large enough to achieve a "significant' result. How would the data sets be corrected for geography to account for different capital appreciation in property values between locations? A concern that data from AC "be gathered without bias, and how will we even know what was sold and when?" This question led to another issue of "with such small sample sizes, how can the results be significant?"

Crowd Funding

At the crowdfunding launch event, once the project method was set, numerous AC members questioned the need to conduct a quantitative survey at all. They proposed that the research should concentrate more on qualitative design issues that architects bring to bear on the design and renovation projects. In August 2018, after a six-week campaign the funding goal and been achieved.

Project Implementation

With funding secured and a contract in place, the project plan was implemented. A Research Associate (R2) was selected and appointed through a selection process via the University Partner (UP). Three applicants were chosen to be interviewed by the selection committee (R1, CH2 and a HR1 a human resources person from UP). R2 was thus chosen based on their previous qualifications in architecture, incomplete architectural PhD studies, and qualifications in property valuation. One of the other interviewed candidates for the position had a PhD with a strong quantitative background. However, CH2 and HR1 panel felt the successful RA was good because they "showed a passion for the project."

Design of the Data Gathering Survey

R2 was appointed and began working on the project in February 2019. The first project steering group meeting was held in March 2019. Shortly, after a draft of the data gathering survey was distributed. In the survey, AC members would be asked to nominate a project that could potentially demonstrate an appreciation in capital gains as a result of an architectural renovation. In developing this draft, R2 employed standard property valuation definitions as a benchmark for the research. This approach ensured that the data gathering survey could be read against well established and well-known valuation standards. In early April 2019 the draft survey and was revised and then resent back to the ACB to allow for further comments. However, these definitions were questioned extensively by the ACB. The returned comments about the survey were extensive, and ACB members had many issues of language regarding the data gathering method, survey questions and valuation definitions.

Pilot Survey

After many iterations, the survey draft was piloted with eight members of the ACB. The purpose of the pilot was to trial the survey and see how architects might upload data to it. Despite agreeing on the draft ACB respondents questioned the survey's format and the time it involved. For example, "I got to Question 26, I am pretty exhausted by the survey. There needs to be a lot of those questions made into multiple choices and or drop-downs to fill in." Another ACB member stated "Maybe link to sold data would be faster? I'm always more supportive of a shorter survey, than a longer, so making it easy = better." One pilot respondent produced a list of 27

alternative questions. This suggested in "order to generate more consistent responses to these questions." This respondent suggested, contrary to the survey's data-collecting agreed method, that street address, property location and site circumstance, were unnecessary questions. Another pilot respondent questioned the research topic: "this should be for more than just architects. There should be a survey for Real Estate Agents etc. I want to know about public perception." Once finalised, the survey had 46 questions, organised into six sections, and it was estimated it would take approximately 25 minutes to complete.

Survey Distribution

It was estimated that the data-gathering survey was sent to all 750 AC members and up to 5000 architects in Australia. The total number of partially complete or complete responses for the study was 90, and 48 respondents completed the entire survey, and 33 plans were uploaded. However, only 56 of the 90 respondents provided street addresses for the selected properties. The average time spent on the survey was 21 min 45 sec.

Survey Analysis

The RA worked extensively on the collected survey data and analysis. A critical task for the RA was to examine the data gathered in the survey, select the architect projects for Pool 1 and employ this data to create Pool 2 using the real-estate property database. The RA worked through each survey response and then attempted to find a compatible property to create the second pool of data. However, these properties were chosen and re-chosen, and re-questioned again, and again by R2. Given the research method, this was not necessary. R2's communication was also centred on discussing expanding the scope of the project, through a more extensive economic literature search, and conjectures regarding the diffusion of architectural styles in property markets. Again, these conjectures were even though the research project had a clearly defined and contracted research method.

FINDINGS

The adopted quantitative research method was not readily understood in the AC system. As a self-organising and autopoietic system, the research project exhibited several systemic characteristics. In this system, research is perceived as a quasi-scientific endeavour, as it is pursued as a design endeavour; for example, the communicative questions about "significance." The most predominant of these systemic characteristics was a prevailing style of communication evident by iterative questioning. These questions were propositional, divergent and conjectural as members of the ACB and AC suggested other ways of doing things. Within the ACB and the broader AC, this system of communication included questioning and re-questioning the research topic, research methodology, research scope, methods, survey wording and definitions and of the data gathering survey. In addition, questions arose regarding issues of bias and statistical significance. This questioning was at odds with the established, and contracted, formulation of the stepwise method of the research projects data gathering and quantitative method of analysis. Remarkably, there were few concerns about the project's implementation and timing.

The AC system responded to the research project in a way that was structured by its self-producing and autopoietic pattern of design thinking. At the outset, the AC system had responded to its external environment, by seeking an understanding the value of architectural services. However, its response to these external conditions was then structured by the AC system's pre-existing structures of design thinking, and the

concept of design as research. As the data survey was being designed and piloted, it was the norms of design thinking that shaped the AC system's internal dynamics of generating, producing and re-producing new questions and conjectures. As an autopoietic system, the AC did not see the research project as embodying a series of pre-existing methodologies and steps in data gathering methods. For the AC It was a project that was a design process characterised by the almost continual cycle of iterated questions. This process was characterised by a constant search, arguably akin to a design studio, seeking new insights through new propositions, questions and conjecture. Even as R2 began to work on the project, further divergent pathways were identified and posited as waypoints in the research process.

It could be found that rather than the AC system being seen as an autopoietic system, led by the ACB, it was merely an association committed to open consultation with members. It could also be interpreted that the above description and findings simply reflect the demands of a community-based research project with AC members who did not agree with the topic. These interpretations do not account for the observation that the communicative responses to the project from the ACB's and AC responses were numerous, widely divergent and conjectural. Moreover, at no stage was there organised or political opposition to the project from the ACB or AC. Winch's (1998) model that architectural design proceeds via an initial conjecture and then followed with several iterations characterise the what was observed above. This was an autopoietic system driven by a norm of design as research.

DISCUSSION

The AC's approach to research can be considered as an autopoietic system whose organisational rules, boundaries, and dynamics are self-generated and based on ideas of design thinking learnt in the design studio. Schumacher (2010) suggests that architecture is an autopoietic discourse, but he limits this to material artefacts (drawings models, etc.), not extending this idea to socio-material and organisational culture. In the case of the AC, echoing Maturana and Varela (1987), external notions of professional value "triggered" the need to initiate the research project. But in the AC's "structurally determined system" design thinking determined how it responded to this external trigger Maturana and Varela (1987). As an Autopoietic system, Winch's model would thus suggest that for architects the "generation of new ideas" predominates over the logic of "design problem-solving." The debates identified by Megahed (2017) around what constitutes architectural research may still be reflected by uncertainties about what research is within the profession. Outside of the design as research culture of the design studio, few architectural schools have research methods as part of their curricula. Understandably for researchers outside of the discipline, looking inside, it must seem baffling.

Research into the architectural profession may be better served by shifting the focus away from the creative-business binary and professional identity. Calls to bridge this divide may simply perpetuate these binaries, concealing an understanding of the systemic nature of the profession (Bos-de Vos 2016, Bos-de Vos and Volker 2017 Samuel 2018). Lohmann's (1987) adaptation of Autopoiesis to the social sciences, and work related to potentialising technologies, suggests that further research could be conducted that examines professional organisations and expertise as systems of communication and meaning.

Arguably, it is these binary theoretical abstractions, and appeals to the complexity of organisations, that cast suspicion on systemic theories: "consistent and durable theory

of the organisational body is simply not possible since organisations are too complex and varied to capture in a set of reliable, repeatable assumptions" Volker (2019). But are professions too complex to theorise as systems? And is it too easy to argue these systems as being shaped as a result of external contingencies? This suggests that in the research design of further autopoietic research, contingent readings must be separated from systemic interpretations.

In contrast to an actor-in-networks approach Chan (2016) employs Bergson, and opens up an autopoietic perspective, arguing that expertise needs to be conceptualised as "process of becoming." It is suggested here that this approach involves looking at systems of expertise as emerging out of tacit, relational, practices and systems. As noted by King (1993), and indicated here, professions should be defined "not as groups of people, but as systems of meaning." Moreover, future studies of architect's the research might pursue an approach that aligns with Lowenstein (2014). He argues that professions develop their vocabularies by "generating and distributing, but maintaining control over, words that others use to guide their thinking and behaviour" (Lowenstein, 2014).

CONCLUSION

In eschewing atomistic models of the architectural profession, a clearer picture of how architects self-organise is gained. Autopoietic theory offers theoretical alternatives to focusing on professionals as agents, or actors-in-networks or in groupings of "unified constellations" always in motion Volker, L (2019). Professional systems, such as architecture, are not simple input-output models, distinct binaries or actor's boundary crossing networks. Instead, these systems can also be seen as self-generating autopoietic systems. Arguably, the AC was a system bewildered by normative research methodologies and methods, but more familiar with its norms of design as research. This is because, for many architects, the research process, like the design process, is a "process of becoming" a continuing design journey and pilgrimage.

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SOCIAL VALUE PRACTICES IN HOUSING ASSOCIATIONS' CONSTRUCTION PROCUREMENT IN NORTH WEST ENGLAND

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Housing associations (HAs) embed social value (SV) in construction procurement processes and use social clauses as contractual Mechanisms to compel construction supply chains (CSCs) to deliver expected requirements. Whereas extant literature provides perspectives of CSCs on challenges in addressing SV through construction procurement, there is limited evidence of procurers' views on this significant matter. Given their social mission and sizeable annual construction expenditure, HAs present a unique opportunity to investigate the current nature, foci and challenges social value construction procurement (SVCP) presents in practice. Based on a review of procurement literature and policies, supported by eleven semi-structured interviews with social value managers in HAs, this paper builds on previous studies to provide context-specific insights into the socially-oriented, not-for profit housing sector use of construction works procurement to deliver SV to local areas and the challenges thereof. The findings reveal a series of interwoven and cultural challenges impeding the full realisation of expected benefits in construction procurement. The lack of policy direction and a clear definition of what constitutes SV present challenges to its advocates. The interviews reveal a series of major organisational challenges that must be overcome if social value is to be delivered effectively. These range from the need to change organisational culture to operational issues resulting from dismissive attitudes among built environment staff.

Keywords: social value, housing associations, social clauses, procurement

INTRODUCTION

'Social value' (SV) is a broad concept which can be traced back to the 19th Century mainly in arenas of business, economic and heritage literature (McShane 2006). However, following the publication of the Public Services (Social Value) Act 2012 (SVA 2012) in England, SV has evolved as a profoundly significant concept in procurement due to its perceived ability to address social, economic and environmental issues in local areas where procurement activities are carried out (Cabinet Office 2015). Notwithstanding its long history, SV lacks a concise and consistent definition thereby leading to inconsistent practices when used within public procurement. Like other public bodies in England, housing associations (HAs) are required by the SVA to consider SV when procuring services (Chartered Institute of Housing 2015). But in practice, HAs have expanded the scope of the law to include

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construction works (Cabinet Office 2015; Chevin 2014). Under its Value for Money (VfM) Standard 2018 and Code of Practice, the Regulator of Social Housing (RSH) in England, has placed obligations on HAs to deliver VfM outcomes (RSH 2018) by among other things, optimising assets and resources, and ensuring they obtain maximum benefits from commercial activities such as procurement (RSH 2018b). Hence, caught between fiscal constraints, the Regulator's VfM demands and raising societal expectations, SV has become an imperative if social impact is to be achieved (Chevin 2013). Whereas extant literature provides CSC perspectives of challenges in addressing SV through construction procurement (Loosemore 2016; Chevin 2014), there is limited evidence of procurers' views on this significant matter. Given their social mission which is supported by the use of housing assets for the good of society (Chevin 2013) along with their £6bn annual investment in new homes (Temple and Wigglesworth 2014), HAs present a unique opportunity to investigate the current nature, foci and challenges social value construction procurement presents in practice. This study is significant as it provides insights into client-side SV practices and suggests how challenges can be addressed. Furthermore, it addresses gaps not only in the wider academic social procurement literature (Barraket and Weissman 2010) but also specifically, that of construction procurement (Loosemore 2016). Commencing with a brief general background on SV, specific social procurement literature is reviewed along with eleven semi-structured interviews with social value managers to contextualise SV within construction procurement. A discussion on the approach to the study is provided followed by the results and discussions in relation to existing literature. The key contributions of the study are discussed in the conclusion.

Social Value: A Brief Background

Social value (SV) appears to date back to 1883 in Australia where it was described as building societies' "contribution to new suburban settlements" (Twopeny 1976 cited in McShane 2006: 91). Dietz and Porter (2012: 23) defined SV as "something of value for society", while Roig *et al.,* (2013) viewed the concept as the social image a customer holds about a company based on its social practices. In accounting, Barton (2000: 226) relied on the concept to argue against the use of accounting principles to value public heritage facilities, as such facilities hold a "substantial social value" to the community…which cannot be translated into financial values. In respect of what could be considered as material in organisations' sustainability reporting, the Global Reporting Initiative (2014:1) advises that an organisation's sustainability reporting topics should include those that have "a direct or indirect impact on its ability to create, preserve or erode economic, environmental and social value for itself, its stakeholders, the environment, and society at large". Likewise, McShane (2006) argued for the management of community infrastructure to consider wider account of the 'social value' of community facilities. This paper focuses on the type of SV that contributes valuable benefits to local areas through organisational operations, such as construction works procurement.

Housing Associations and SV

Housing associations, like other public bodies in England are expected by the Social Value Act 2012 to consider issues relating to social, economic and environmental well-being in procurement in order to generate added benefits for the communities they operate in. As a social business sector which uses its housing assets to "act for the good for society" (Chevin 2013: 66), it is seen as a pivotal force in addressing the shortage in housing, tackling unemployment, skills training and providing for the

vulnerable in society. However, HAs have undergone various fiscal and regulatory restructuring which impact funding (Chevin 2013). It is argued that HAs could benefit from using social value to achieve value for money (VFM) (Smedley 2013; Chevin 2013) and to improve performance, accountability and gain business advantage (Tomlins, 2015). Temple and Wigglesworth (2014:7) indicated that "many housing associations have a direct mandate, mission or duty to work for social purposes and this in turn informs their business decisions", a view supported by the Chartered Institute of Housing (2015). The above emphasises that SV is a regulatory, fiscal and ethical imperative for HAs. It is evident that HAs activities are influenced by regulatory, social and business ecological systems they operate within.

SV Construction Procurement (SVCP) in Public Bodies (PV and Shared Value)

Within the general context of procurement, SV could be perceived as an outcome, a product or a process of social procurement (SoP) or sustainable procurement (SP). SoP relates to procurers' deliberate use of purchasing power to "create social value" (Barraket and Weissman 2009: 4) or to "achieve social outcomes above and beyond the products and services required" (Bonwick and Daniels 2014: 6). The SP view affirm SV as: "A process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy whilst minimising damage to the environment" (DEFRA 2006, adopted by Association of Greater Manchester Combined Authorities, 2014). This paper describes Social Value Construction Procurement (SVCP) as the use of construction procurement expenditure, processes and resources to generate additional socio-economic and environmental benefits for local communities during commissioning and procurement. SVCP is a longstanding practice in response to rising demands for procurement expenditure to be used to secure added benefits for society. Starting from at least the 19th Century, proponents of SVCP argue that it can and should be used to alleviate socio-economic and environmental problems in local areas (McCrudden 2004; DEFRA 2006, International Labour Organization (ILO) 2008, Arrowsmith 2010; MacFarlane 2002). For example, the UK's Fair Wages Resolution 1891 considered how public works projects could address the social and economic needs of workmen and communities.

SVCP's theoretical basis can be seen to demand an alignment with public value (PV) (Erridge 2007) and shared value (Porter and Kramer 2012) principles. These perspectives are therefore used as lenses to investigate current practices to understand the foci, issues and challenges. Proponents of PV and shared value point to the failure of market models to deliver socio-economic and environmental goals for society. They argue that market models lead to the prioritisation of commercial goals over socio-economic benefits for society and therefore advocate a balanced approach. Erridge (2007) noted that in spite of the regulatory, commercial and socio-economic goals underpinning UK public procurement policy, there was an over-emphasis on commercial objectives. To resolve this imbalance, Erridge (2007) asserted that a 'public value' concept provides a means to assess and achieve required goals in a balanced manner through a greater emphasis on public consultation and the impacts and outcomes of procurement. In asserting that shared value is not philanthropic, PV and shared value highlight the various areas and roles of organisations in relation to their external environments ('ecological systems') in pursuit of societal benefits. They underscore the need for organisations to act as cohesive wholes to achieve organisational objectives.

In exploring the role of social enterprises in delivering social value during construction procurement, Loosemore (2016) found that traditional procurement culture and practices were hampering the involvement of social enterprises' participation in bidding for works. Loosemore revealed a lack of studies on social procurement in existing academic procurement literature. To address this gap in knowledge, Loosemore (2016) called for social procurement studies from project-based organisations. Likewise, Barraket and Weissman (2009) advocated for context-specific studies on social procurement in the not-for-profit sector following a systematic review of studies and policies on social procurement in respect of social enterprises. There have been various academic studies on social value construction procurement which have provided crucial insights into social value practices in various organisational and/or project settings (Rani *et al.,* 2019; Cartigny and Lord 2019, 2018; Mulholland *et al.,* 2019; Awuzie *et al.,* 2018; Farag *et al.,* 2016; Awuzie and McDermott 2016). However, these do not adequately examine social value practices within a specific sector and/or regional contexts and in relation to subject matter of contracts and specific SV regional policies. This gap could arguably limit understanding of social procurement practices, their issues and challenges in sector-specific contexts. Hence, this study focuses specifically on the socially oriented project-based sector in a geographical context, influenced by a common regional social value policy, in relation its use of construction works procurement to deliver social value to local areas.

METHOD

A phenomenological epistemology was used to gain an understanding of SV from research participants' experience of this reality. One-to-one semi-structured interviews were undertaken to collect primary data as opposed to observations. These interviews allowed the researcher control over the line of questioning (Creswell 2009). This allowed for SV to be understood based on individual interpretations of what it means to their organisations. The perspectives of designated SV managers in HAs produced in-depth information and valuable insight into the topic based on the depth and detail of information acquired (Denscombe 2014).

In keeping with the qualitative design for this study, an exploratory sample of eleven interviewees was used. As an exploratory study of a relatively new topic, the researchers were not seeking to generalise the findings to the population from which it was chosen but rather to generate new insights, hence, the emphasis here was not representativeness (Denscombe 2014). Interviews were tape recorded with the express consent of interviewees. Interviews lasted between 30-45 minutes. Snowball sampling was used to gain access to research participants following appropriate criteria in Bryman (2016).

Braun and Clarke's (2006) thematic analysis approach informed the analysis of primary and secondary data in view of the aim of the study and the epistemological lens chosen for the study. Themes were identified inductively (Braun and Clarke 2006) from the interview data (Patton 1990) in line with the study's unit of analysis-definition/nature of SV in construction procurement; foci; issues; and challenges. The lead researcher transcribed all audio interview data. The transcription process helped the researcher to become familiar with the research data; and helped to identify and select themes/patterns which were of interest to the researcher for analysis and discussion (Braun and Clarke 2006).

RESULTS AND DISCUSSIONS

Four units of analysis: nature/definition, foci; issues and challenges underpin results and discussions in the context of key themes derived from social value literature, legislation, policies and interviews with social value managers.

Definitions of SV, nature of practice and drivers of social value construction procurement

The findings indicate that HAs generally conceptualise SV in construction procurement as an 'addition', a 'bonus', and/or 'help' for tenants and residents as per the principles in the Social Value Act 2012. These current views align with the wider literature which defines SV as 'something of value' (Dietz and Porter 2012: 23) and/or a 'contribution' of businesses to society (Twopeny 1976 cited in McShane 2006: 91).

Systems theory within human development (Bronfenbrenner 1979) and organisational corporate social responsibility (CSR) context (Loosemore and Phua 2011) is used here to explain HAs practices, issues and challenges. Defining a person's ecological environment as "a set of nested structures, each inside the next, like a set of Russian dolls", Bronfenbrenner's (1979: 3) Microsystem, Mesosystem, Exosystem, Macrosystem and Chronosystem conceptualises the developing person in relation to their environment. Bronfenbrenner reveals that interactions between the inherent qualities of people and their environment influence their behaviour. Hence, to understand a person's choices and behaviours, one needs to consider the complex 'ecological systems' around them. Similarly, Loosemore and Phua's (2011 cited in Loosemore 2016) study of CSR activities of profit-oriented construction organisations assert that operational activities are dependent upon context-specific factors in the environment organisations operate. In his later study on social construction procurement with social enterprises, Loosemore (2016:137) suggested that the "supra-, macro-, meso- and micro-analytical framework" could be used to conceptualise "the social procurement debate at a construction project level."

Applying these ecological theoretical perspectives (Bronfenbrenner 1979; Loosemore and Phua 2011) within the context of a socially oriented, not-for-profit HAs sector, this study found that social value construction procurement is predominantly influenced by the ecological systems the sector is situated in. The regulatory, commercial and societal expectations within HAs ecological systems were crucial drivers to SV uptake and implementation in construction projects. The sector's description of social value, through to issues and challenges it encounters in efforts to secure and deliver socio-economic benefits to local area are mediated through and/or impacted by a myriad of organisational, local area, regional, national and international factors which in turn affect its social procurement behaviours and effective practices. Inherent organisational characteristics such as mission, type of service, location, size, community, building projects and tenants, interact with factors in the micro, meso, macro and supra level environments to influence how HAs define social value in construction procurement and the SV they seek to achieve for local areas. For example, HAs' definition and foci of SV are primarily influenced by organisations' strategic objectives for commissioning/procurement of building projects and perceived community needs (meso and micro level factors), the Social Value Act 2012 and a regulatory imperative to deliver SV (a macro level factor).

Similarly, regional linkages and their associated social value policies influence the adoption of social construction procurement principles at strategic levels of organisations which then drives practice at lower levels in organisations. The nature

and foci of SV in construction procurement as found in this paper is in keeping with public value (Erridge 2007) and shared value (Porter and Kramer 2012).

Furthermore, this study's findings indicate that regional linkages and inter-organisational collaborative working (meso level environmental factors) play a crucial role in addressing inconsistencies in SV implementation in construction procurement in HAs (HACT 2015) and/or low take-up in other public sector bodies (Guthrie and Opoku 2018; Cabinet Office 2015; Burke and King 2015). Strategic level managers of HAs are closely linked to Association of Greater Manchester Authorities (AGMA) who have developed a social value policy for members. As a result, HAs adopt AGMA's strategic social value objectives into their own local policies to ensure a cohesive approach to tackling social issues within local communities. HAs have formed a Working Group specifically looking into SV and do benchmarking exercises among themselves with the intent to embed SV in procurement.

> …a lot of this comes from our chief executive who is firmly pushing this agenda [and also] our board as well and our roots through […]City Council… they have been pushing this agenda for the past 10-15 years in the wider ecosystem, [through] stuff like the GMCA Social Value Policy….

> ...our Chief Executive… and other executive members have a presence on […] Authorities. So, they are involved with […] and you will see from the social value policy that we've got in place that we'd actually adopted their [Authorities' name] social value policy objectives within our own to try and have a cohesive approach.

Community consultation

Community consultation is critical to delivering social value (Erridge 2007). Without good insight as to what communities actually need, SVCP requirements in contracts would go to waste (Chevin 2014). The Social Value Act 2012 suggests public bodies should consider whether communities could be consulted during the commissioning and procurement of goods and services. This study found that HAs do not generally consult the wider community to determine local needs before defining SV requirements included in construction contracts. Due to resource constraints i.e. time, cost and staff constraints, the sector generally uses four key approaches to identify SV needs of local areas, namely: internal staff, external local agencies, users of their services and primary research. These include local neighbourhood officers working with local agencies such Job Centre Plus in the local area or through undertaking their own research into areas of needs. Again, in respect of Bronfenbrenner (1979), Loosemore and Phua's (2011) studies, insights from interviews show that decisions regarding community consultations during construction procurement are contingent on inherent characteristics of the HAs, location and size of the project (mesosystem) and for project (chronosystem). The study also reveals the important roles of inter-organisational working in determining social value needs of local areas during construction procurement.

> We wouldn't tend to do that [community consultations] … our schemes are much smaller. It wouldn't be cost effective in terms of time and effort and all the rest ...

Organisational/workers' culture and attitudes

Organisational culture is defined as the way members of an organisation relate to each other, their work and their external environment compared to other organisations; this can "enable or hinder the achievement of organisational strategy" (Hofstede Insights n.d.). Hofstede states that [organisational or individual] "performance depends on the fit between strategy and culture". This study found misalignments between procurement staff 's perception of their work and organisational strategic objectives to

deliver SV through construction procurement. Data from interviews reveal that *"... there is still a perception that the community involvement, community investment…the "pink and fluffy stuff" ..."* do not form part of built environment procurement staff's perception of their role within the procurement process. This view has in turn hindered their commitment to HAs SV agenda in construction procurement. This study also found that HAs have accessed external legal inputs to address inconsistencies, cultural attitudes and to ensure compliance with EU procurement regulations. Some HAs have worked with solicitors and consultants to develop SV tool kits which serve as guidance for procurement staff on how to embed social value into relevant procurement undertakings.

Modern procurement systems

Within the infrastructure project context, Awuzie and McDermott (2016) investigated the influence of contracting strategies in infrastructure client organisations' (ICOs) ability to implement social value within infrastructure delivery systems (IDS). They found that contracting strategies have significant impact on clients' ability to implement SV within supply chains. In respect of the aim of this study, among some of the issues and challenges impacting on SV practices, HAs suggest that although procurement systems such as Framework and land deals do not negate the opportunity to deliver SV, they offer lesser opportunities to leverage SV for local areas compared to other systems. This is because there are limited opportunities within framework procurement for bespoke questions which are predicated on specific local area needs.

> … we might do a Framework call-off, so, it's already been procured, and we are just 'calling off' that Framework. So, there is less opportunity for a bespoke question…

> …because the Framework covers a lot of organisations with very different footprints to ours, how they define 'local' on the framework isn't how we would define 'local'. They say that 'local' should be within 20- mile radius of the site but we are only 9 miles end-to-end. So, if we were to be 20 miles from the site, we would be well into North Wales or Manchester and that in terms of the community that we work with, doesn't sit with what we see as local.

In contrast to Awuzie and McDermott (2016), the link between contracting strategy, and successful SV implementation and delivery in this study's view, is tenuous.

Communication, resource limitations and organisational priorities

Effective monitoring of social value embedded in contracts is essential to the achievement of desired outcomes (Cabinet Office 2015). However, without effective communication between relevant functional areas of HAs, monitoring of SV delivery can be hampered. This study found this crucial element in securing SV, lacking between HAs SV managers and built environment staff on construction sites.

According to Erridge (2007), a lack of balance between regulatory, commercial and social objectives in public procurement strategies can compromise delivery of public value. This study found some tensions between HAs regulatory, commercial and social procurement objectives. Although SV is promoted as critical to meeting RSH requirements and social mission, interviews suggests HAs tend to relegate SV monitoring and reporting as a secondary consideration during the construction phase of projects in favour of commercial goals in relation to quick completion and rental income from letting homes. Therefore, project-based construction teams give maximum attention to delivering projects to specified quality and timescales to meet such strategic objectives rather than social value.

> The main challenge has been the relationship with the development team-getting them to remember to send me the information ... They are supposed to share the information

> with me on a monthly basis so I can monitor it…and the biggest challenge has been getting the information from people.
>
> …a lot of the time people are more interested in…if it is building a wall, they are more interested in the wall - 'Is it the right height and the right quality?', than they are in who actually built it … if they are being told: 'you've got to have these houses done'. 'You've got to get them built on time, because we need to get them let', then that is what they are going to put their effort onto.

CONCLUSIONS

As a social oriented project-based sector, HAs sector are mandated by their mission, legal and regulatory frameworks to use their assets and resources to deliver social value to communities they operate in. As such, the sector presented a unique opportunity to understand the definitions, foci and challenges of social value in construction procurement (SVCP) in light of the dearth of academic studies from not-for-profit, client-side of the social procurement debate. Using a qualitative approach and a semi-structured interview method with social value managers, the study found that HA nature/definitions of and activities carried out in respect of social value in construction procurement are influenced by complex interactions between their intrinsic characteristic and wider environmental factors (ecological systems). Regional level linkages influenced SV policies at organisational levels while use of external consultants was seen as an approach to addressing inconsistencies in practice and complying with regulatory frameworks in the sector. However, organisational and worker's culture and perception of their roles adversely impact effective SVCP practices. HAs do not prioritise SV in the same way as time and cost objectives. This has affected the culture and attitude of key built environment staff who are under pressure to meet top priorities of building projects. Furthermore, poor communication and lack of resources also hamper effective reporting and monitoring of SV being delivered by the supply chain during construction of projects. It is suggested that strategic management make SV a primary objective if it is serious about delivering such benefits for local areas. Management could also take a proactive approach in ensuring operational activities are well resourced to enable monitoring and reporting of SV. Built environment staff on site responsible for monitoring and reporting could to be given the necessary support to motivate buy-in.

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EMPOWERING LOWER-LEVEL MANAGERIAL LEADERS: FOSTERING A 'DWELLING WORLDVIEW' THROUGH BOTTOM-UP INTERVENTIONS

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A critical challenge for construction companies is to find means of improvement that include project and construction site as well as provide learning and added value for company and industry. One viable means is well-designed interventions at production level which focus on construction-site perspective and needs. Yet, studies on how best to design interventions that would result in an alignment of intervention facilitators to practitioners at operative level remain negligible. Drawing on observations and extensive field notes as well as participants written documentation, we show how learning and knowledge sharing can be enhanced where the practitioners' perspectives and needs are in focus. The intervention was designed and developed in a joint venture between academia and four construction companies and grounded on an experiential learning-by-doing philosophy to rapidly assess work conditions on site and work toward improvements. Here we give voice to the participants and allow them to inform us of some of their experiences, in show that an intervention enabling participants to take ownership of the why, how, for what and for whom of improvement methods does empower them to drive improvements bottom up. The contribution of this paper is twofold: 1) it introduces an intervention method that supports bottom-up improvement initiatives; and 2) it showcases learning and knowledge sharing between construction companies and academia on the one hand, and inter-organisationally on the other.

Keywords: experiential learning, reflective, interventions, knowledge sharing

INTRODUCTION

Construction is a heterogeneous project-based sector composed of a wide variety of professional disciplines which are critically dependent on the sector's ability to create and share collective knowledge across boundary interfaces, both intra and inter-organizationally (Fellows and Liu, 2012; Boyd, 2013; Kokkonen and Alin, 2015; Anheim, 2002). Although research on cross-disciplinary interaction and negotiation is increasing within the construction-management literature (Hartenberger *et al.,* 2013; Hughes and Hughes, 2013; Fernie *et al.,* 2003), little attention has yet been paid to the

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interactions and negotiation between academics (management scholars) and practitioners in interventions.

Management theories (e.g. TQM, Six Sigma, Lean, Learning Organisations), models (e.g. Leavitt's Diamond, Lewin's Change model) and tools (e.g. Balance Score Card, SWOT) are most often introduced and disseminated in organisations by internal or external consultants during strategic interventions, aka away-days (e.g. Raisanen and Löwstedt, 2014). However, much of the research on strategic interventions in focuses on top-management, privileging the management experts/consultants. These are depicted as boundary brokers whose role it is to 'help' top-management re-think and transform their strategic practices (e.g. Werr and Styhre, 2002; Heusinkveld *et al.,* 2014). Sturdy *et al. (*2004) critiqued this notion for "celebrating consultancy as a privileged arena" and reinforcing already existing power relations and the discourse of managerialism. They suggest that management consulting has been more about "silencing" groups than about empowerment and participation. In other words, rather than an alignment of experts and clients, the alignment would seem to be of the client to the experts.

Hence, studies of consultant interventions have tended to focus on the role of the liturgy specialists, e.g. those that plan and run the interventions, i.e. internal or external management experts. In a similar vein, training interventions, e.g. leadership and safety training of project leaders and personnel have been criticised for failing to achieve the changes intended (Knauseder *et al.,* 2003; Styhre and Josephson, 2007). Chia and Rasche (2010: 35) have critiqued such endeavours as belonging to a "means-ends logic," where action is viewed deterministically as the results of the intentions of individual actors. Instead, they advocate a "dwelling worldview" that accounts for the tacit dimensions of a collective knowledge consisting of phronetic (practical wisdom) and mëtic (know-how) intelligences in day-to-day practices over a longer duration. Such a perspective needs to consider the immanent, shifting and transient episodes, which, although ephemeral, remain as unconscious impressions, wielding influence on ongoing practices (which aligns with Sturdy et al's aforementioned critique).

To our knowledge, this critique remains largely conceptual; there seems to be a lack of empirical research focusing on the unfolding of intervention programs of management experts and lower-level managerial leaders. Furthermore, studies on how best to design interventions that would result in an alignment of management experts to practitioners at operative level remain negligible. Indeed, strategic interventions in the construction sector remain under-researched, with few exceptions (e.g. Löwstedt *et al.,* 2018; Raisanen and Löwstedt, 2014).

This paper introduces a joint venture, VALLA Coach, between academia and four construction companies to develop and test methods for improved performance at production level. The purpose here is to show how learning and knowledge sharing are enhanced in an intervention program where the practitioners' perspectives and needs are in focus. To exemplify how a 'dwelling worldview' may successfully be used in an intervention, we focus on the first module of the program as an illustrative example of the theoretical and methodological underpinning of the intervention.

The data from which we draw consist of observations and extensive fieldnotes of the intervention. These were carried out and documented by the third author, who is also the social scientist of the team. Additional data include participants' written reports and process reflections as well as the facilitators written feedback comments on the participants' written tasks. Note: the research design and methods used are described

throughout the paper rather than in a separate method section since these are intertwined with the design of the intervention.

Context, Rationale and Intervention Overview

Construction business is characterized by a large degree of decentralization and fragmentation due to its project-based set-up (Kim and Nguyen 2018). One of the challenges is to find means of improvement that include the project and construction site yet provide learning and added value for the company. This entails finding a balance between top-down decisions and bottom-up activities, each preferably feeding off the other (Dubois and Gadde 2000; Kristiansen, Emmitt, and Bonke 2005), as well as appropriate and realistic means of measuring and following up on daily business.

Another connected challenge is the difficulty of knowledge sharing and learning, especially experiential and tacit knowledge, between projects within the company and between companies which work together (Klitgaard *et al.,* 2016). Learning needs to be action-driven and include time for reflection loops, allowing for both individual reflection and, more importantly, collective reflection (Raisanen and Gunnarson, 2007). Through collective reflection, both learners' and facilitators' perspectives and past experiences may be tapped into, and new perspectives can emerge and be articulated. Knowledge becomes a collective endeavour rather that an individual, competitive acquisition to be examined, and then often forgotten. Schön (1978) advocated two kinds of reflective exercises for learners: reflection-on action and reflection-in action. The former entails reviewing and following up on an accomplished action. The latter entails continuous question-raising while undertaking an action where the crucial question is not "what should be done", but "why should it be done in this way" and "what are the consequences when it is done in this way" and "is there a more effective way". In other words, reflecting-on combined with reflecting-in action nurture double-loop learning (Argyris and Schön, 1974), where learners are not only challenged on what needs to be changed, but also to reflect on their own underlying assumptions when moving towards a more sustainable future.

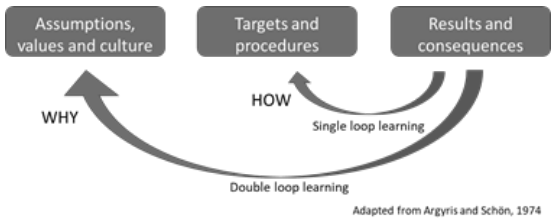

Figure 1: Double-loop learning

To enable Schön's reflection work in time-pressed workplaces, various kinds of activators are needed, of which actionable feedback (Cannon and Whitherspoon, 2005) and timely coaching (Whitmore, 2009) are probably the most powerful. However, these kinds of enablers are not innate skills, but like most skills, be they technical (hard) or social (soft) require training to build experience and situated common sense. Although coaching has of late become a popular method for enhancing engagement and learning in organisations, it remains under-researched in the construction-management literature.

The VALLA Coach Joint Venture: Brief Overview

VALLA Coach was developed as a platform of methods to increase productivity and safety at the production level on construction sites through problematising the 'what, why and how' of measurement to increase productivity. VALLA Coach (i.e. Ski-

waxing Coach) metaphorically encapsulates our vision: A platform that would function as lubricant, both technically and pedagogically, to stimulate learning-by-doing, reflection and improvement of processes and production flows on construction sites. The aim was to develop an intervention that would empower lower-level managerial agents of change. To address situated real challenges, VALLA Coach was therefore developed in close interaction between academic and industry partners. Three academic institutions and four Swedish construction companies collaborated over the last three years to develop and test a methodology grounded on an experiential-learning philosophy and a number of qualitative and quantitative methods and tools. The joint venture was carried out in three phases (see Simu *et al.,* 2019). Phase 1 (2017) focused on dialogues with the industrial partners to understand how the industry measures and manages performance and development on building sites. Phase 2 (2018) concentrated on selecting existing methods and adapting new methods to improve production practices through evidence-based measurements methods. Four of these methods were tested in case studies in the four partner companies. In phase 3 (2019-20), which is the focus of this paper, we developed an intervention training program in the use of the four methods for young managerial leaders at production level.

Overview of the intervention program

The program curriculum consists of five two-day modules (10 days in all) spread over a 9-month period. Each module focuses on a technical method combined with the training of coaching skills (Table 1). Between each module (approx. 6 weeks), participants are tasked with applying the method in one of their company projects and documenting the application in a report (reflecting-in action). They are also tasked with writing a reflective commentary (free writing) of their learning process (reflecting-on action)

The 10 participants of the training intervention (2 per company working as a team) hold positions as supervisors, team-managers, project managers or process managers in their respective companies, which means they are well-grounded in the operational work on construction sites. They were selected by the partners as potential agents of change and future trainers in VALLA Coach methods. Hence, we view the intervention as a 'train-the-trainers' venture.

The five modules in the intervention program centre around four methods: conducting a diagnostic, working with standards, measuring performance and planning production, see Table 1.

The diagnostic method, Rapid Site Assessment, was the theme of the first intervention module. Before discussing the learning from the module, we briefly describe the theoretical underpinning of the method.

Rapid Site Assessment

Within Lean Thinking (Womack and Jones, 2003) diagnostic and assessment of the current situation are essential before attempting to implement improvement programs. Within the VALLA Coach platform, a Rapid Site Assessment (RSA) was developed as a tool for understanding operations and to obtain a baseline for improvement initiatives. The RSA is mainly based on the Rapid Plant Assessment (RPA) tool as described by Goodson (2002) and has also been influenced by other diagnostic tools and quick-scan methodologies (e.g. Upton, 1997; Hofacker *et al.,* 2008; Malmbrandt and Åhlström, 2013; Urban, 2015).

Table 1: Brief process description of the five-module intervention (the focused module is highlighted)

THEORIES and METHODS	VENUES	2-DAY Activities		LEARNING-BY-DOING TASKS (HOME-WORK)	
		Reflection-on method	Reflection-in method use	Reflection-in practice	Reflection-on practice
Industrialised building and RSA	University studio and break-out rooms	Overview, RSA underpinning, Giving effective feedback	Trial RSA on site and presentations; listening and feedback practice	Do an RSA in the respective companies; write report and prepare oral presentation	Individual process reflection highlighting insights
Stable processes and Lean thinking	Lean Training Centre at Vibracoustics' factory	Lean thinking and practice: element document and standard operations procedure (SOP)	Presentations, Q&A, reflections Assembling and disassembling peddle-cars and feedback x3	Develop a standard for to improve a work process on site; write report and prepare oral presentation	Individual process reflection highlighting insights
Targeted measurements, problem-solving & coaching	Safety Parc Arlanda: new safety-training centre	Problem formulation PDCA, A3, Fishbone, 5 Whys, KATA Coaching	Presentations; Q&A, reflections Break-out groups to work with A3; Coaching exercise	Problematising the standar what and how to measure, how to implement and coa Document in A3, prep presentation	Individual process reflection highlighting insights
Planning	Partner company Malmö branch	Goal setting and follow-up Last planner and planning Organisational learning	Presentations, Q&A, reflections Project-planning simulation-LEGO	Based on experience from testing the methods, develop a proposal for implementation in your company	Individual process reflection highlighting lessons learned
Conference set-up and validation	web- conference (due to Covid-19)	Conference presentations, Q&A,	Feedback and follow-up		

The RSA was developed for the construction industry based on a workshop with industry representatives and experts using the RPA as stimuli material. From this, a first version of the RSA was created by a group of researchers, a version that was later tested on construction sites through a series of student projects and masters' thesis projects. From the knowledge gained from these industry applications, a second version of the RSA was developed and used in the VALLA Coach intervention module.

The RSA method is based on three steps: preparation, site visit, and evaluation. The preparation includes setting up the RSA team, dividing responsibilities between the team, obtaining site information and setting up a plan for the actual site visit. The site visit should be short (45-90 minutes) and constitutes two parts: A walk-through of the construction site and an interview with key personnel (typically site manager). The two parts are guided by two assessment tools: the RSA rating sheet for the walk-through and the RSA Questionnaire for the interview (Figure 2).

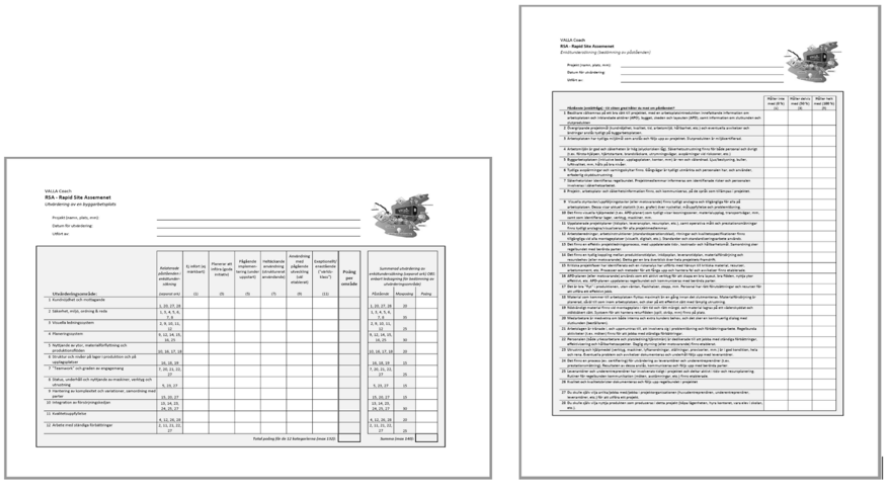

Figure 2. RSA rating sheet for the walk-through and the RSA Questionnaire for the interview

The rating sheet ranks twelve categories of the current status of the site, which is also informed by the 28 questions in the questionnaire. An evaluation should then be

conducted immediately after the site visit by the RSA team to discuss and collectively rate the twelve evaluation categories to identify main areas for improvement. The team also writes a short report on its overall impression of the site, which highlights categories that warrant improvement as well as those that could be illustrative best-practice examples for other sites and projects.

An RSA can thus be used to initiate an improvement program for the site, the project and the company. It can also be used to compare project performance and for longitudinal studies of project performance and improvements at single sites. Note that improvement initiatives are not a part of the RSA method, and not included in this module of the VALLA Coach intervention.

FINDINGS AND DISCUSSION

This section is divided into two parts. The first part draws on fieldnotes from observations of the trial RSA (Table 1) carried out by the participant teams on the sites of two house-building projects close to the module venue, and the second part draws on data from each team's documentation of the RSA they carried out in their respective company and from the individual process reflections as well as observations from the oral presentations of their task (see Table 1). All the co-authors were present as facilitators and coaches.

RSA Intervention: Theory and Trial Learning-by-Doing

During the two-day module, the participants were given a theoretical introduction of the RSA method: purpose, methodology and tools (see Goodson, 2002). In break-out groups, they discussed the methodology and prepared their trial RSA, using the two tools mentioned above. They were coached as the need arose. They then visited two respective house-building sites, two teams per site, where they were guided by the site managers, who provided them with a history of the project and answered the teams' questions. Right after the visit, the respective teams evaluated the site visited based on the RSA tools. Each team then presented their RSAs, to which they received feedback from fellow teams and from the facilitators.

> From the fieldnotes: The site manager started off by giving the participants a short history of the project. I [observer] wonder how well the team members really listened! They kept interrupting by bombarding the site manager with detail questions rather than trying to take in the big picture. The teams seem to be driving their own agendas. The site manager takes the onslaught with equanimity, but the yes/no questions, could have been perceived as threatening by a less experienced site manager. Team members stop to chat here and there with various site workers. Once back at the venue, they have great difficulties sorting their observations into the tool categories. Much discussion and very interesting reflections concerning their lack of observation training and difficulties of stepping out of their comfort zones.

Despite the participants' familiarity and knowledge of processes and practices of building sites, the fieldnotes intimate that they lacked three important social skills for this kind of task: listening, laying aside their own agenda, and posing open questions. They became acutely aware of these flaws when they reflected-in action and tried to document their RSA. In a debrief session, we asked them to reflect-on action by voicing their experiences of the trial RSA.

> We went in with biases and asked questions that were of concern to us rather than to the RSA

> Easy to get carried away and focus on project or production specifics rather than an overall assessment of site operations

> We have to think about how we pose questions; we need to learn how to pose follow-up questions rather than closed questions
>
> I need to let go of what I already know, the way things are done in my projects. I have to talk to several site workers before making an assessment
>
> There is always a psychological dimension to doing a site assessment. We [the RSA team] are not there to judge, but rather to support the site in finding areas for improvements together with them

The debrief was followed by a theoretical session focused on the what, why and how of actionable feedback, including a role-play aimed at making the participants 'bodily' aware of how disempowering it feels to not be listened to. The reflection-in and on the listening activity had a strong impact on all the participants, reflected in iterated deliberations, discussions and shared anecdotes throughout the program concerning the importance of knowing how to listen and the need of continuous training to perfect the skill.

RSA Intervention: Learning-by-Doing on Site

As mentioned earlier, the pedagogical design of the intervention draws on Schön's reflection-in and on action, practice and process. Both the two-day module and the 'home' tasks were designed to enable both types of reflection (Table 1). In the module, the participants collectively reflect-on the method (theoretical underpinning) guided by the facilitator and reflect-in the method use in trial practice facilitated by coaching. The same reflections are built into the 'real' method practice in the respective companies. Thus, the teams reflect-in practice as they document their RSA and they reflect-on practice and process as they write their individual reflections and present their RSA at the start of the following module (Table1). What follows are some quotes from the participants insights.

> For improvements to take place, the team doing the RSA must work continuously with the site management and coach them based on the outcome of the RSA as these relate to the company values.
>
> We have to struggle against the "NIH (Not-Invented-Here) syndrome. Most sites have been involved in improvement programs before without any noticeable improvements taking place. Hence, company and site culture are important to consider when planning an RSA and follow-up action. We need to work together with the site workers and to make them understand that we are there to help them not to 'grade' them and 'blame' them for their mistakes.
>
> It is very hard to set pre-assumptions aside and really take in the site, the information from interviews, and make an un-biased assessment of the site.
>
> Very hard, but very important to ask open-ended questions and wait for the answers, even if it means periods of silence

These reflections and concerns mirror the ones voiced after the trial RSA, but at a deeper and more informed level. The teams found that as diagnostic method, RSA seemed to be a viable and useful, albeit not exact tool to use in endeavours to improve productivity in their companies. Moreover, they had through their two rounds of learning-by-doing become both mindful and respectful of the need to hone their social and observational skills through further practice and training. More importantly, they reflected over the "utmost importance" to provide feedback to the site after the RSA. This as a means to both initiate improvement programs and to gain credibility within the project for future RSAs/site visits. By doing RSAs on many projects, it would be possible to detect systematic under-performance in the organization. Hence, they

agreed that RSA could inform both site improvements and company-improvement programs and were eager to continue using the method.

Argyris and Schön (1978) argue that real learning can only take place through action and reflection. For us, this means that learners need an unthreatening forum in which to 'perform' the theoretical knowledge conveyed and to learn-by-doing. Learners need to appropriate new knowledge and information not only with their minds, but also with their bodies. The Valla Coach intervention has attempted to provide such a forum and encourage a dwelling worldview rather than a means-end logic (Chia and Rache, 2010). Participants have been given ample opportunity to practice both giving and receiving feedback, which is difficult and challenging (Cannon and Whitherspoon, 2005). Through the documented observations and fieldnotes of the participants interactions with each other and facilitators, their actions and talk through the modules, we see a definite increase in self-confidence. From being rather dubious about their ability to influence higher-level managers, at the end of the program they were much more assertive in their demeanour and propositions, which can be the result of feeling more empowered.

CONCLUSIONS

The purpose of this paper has been to show how a learning-by-doing intervention based on participants' perspectives and needs can foster embodied, experiential learning and a dwelling worldview. More importantly, it can empower lower-level managerial leaders to push production process and flow improvements bottom-up to achieve balance between top-down directives and bottom up actions. The underpinning theoretical and methodological underpinnings of the intervention could be used for training-trainers in the use of a variety of different methods and tools.

Our contribution to construction management is twofold. First, we introduce a novel intervention method that supports bottom-up improvement initiatives by, in our case, training lower-level managerial leaders in the use of four performance-improvement methods. Through providing participants an unthreatening forum, opportunities for trial practice, coaching and actionable feedback, they were able to appropriate the methods and test how they could be adapted to their own contexts. More importantly, the underpinning pedagogical philosophy of reflecting in and on action facilitated through coaching pushed the participants question some of the tenants of the methods. Their questioning, in turn, led to double loop learning among the facilitators as well.

The second contribution is that VALLA Coach has succeeded in creating a viable forum for collective learning and knowledge sharing across disciplinary and organisational inter and intra boundaries. Top managerial levels from four construction companies and academics from three universities worked intensively and closely to identify relevant process and flow problems in current building-site environments and to develop and test the selected methods in situ during phase 1 and 2. During the intervention, lower-level managers revisited many of the identified problems as they learnt to use the four methods, but now from a bottom-up perspective. These two perspectives met in the final module in which the participants were tasked to choose one of the methods and write a proposal for the why and the how of its implementation in the company. We organised a conference event, where each team presented its proposal and top managers and the directly superior managers of the participants were invited and also attended. The event generated interesting discussions across company boundaries, and the teams were later contacted by several of the 'competing' companies for more detailed information. One team presented a

Proposal for implementing RSA and have been mandated to carry out their proposal company wide. This positive outcome corroborates the viability of the intervention and the value of joint projects such as VALLA coach.

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