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Research Education for Architecture Students – Case Study of an Academic Reading Circle

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Abstract

This paper describes Tyson Seburn's (2016) Academic Reading Circle (ARC) groupwork model applied on an introductory research course taught online at the Aalto University, Department of Architecture since 2021. The model was adopted to respond to an increasing demand for research skills among architectural professionals, to support academic literacy and an architect-researcher identity, to lower the threshold between academia and practice, and to cater students with knowledge of the rich methodological opportunities in architectural design fields. The experiment indicates that the rigorously structured ARC model provides an efficient framework for analytical and discursive reading and is highly adaptable to online education on the Master's and Doctoral level. According to both the teacher's experience and the students' feedback, the model increased student collaboration and peer-to-peer learning and enhanced positive attitudes towards advancement of architecture through research and analytical thinking. The model also entailed some risk elements especially if the overall course programme is complex or the group size too large. The paper describes the pedagogical setup, explains the implementation and adaptation of the ARC model, and discusses some ideas for further development.

Keywords: online architectural education, architectural pedagogy, architectural research, reading circle, online group work

PEER-REVIEWED ARTICLE • REFLECT & RE-EDUCATE

Introduction

In an essay originally dated 2005, Jeremy Till, British architect and educator, identified the urgency to let go of old, unproductive beliefs and develop feasible frameworks to incorporate in the mindsets of academics and practitioners the idea of architecture as a distinctive field of knowledge worth developing through original, significant and rigorous research (Till 2005, 2017, 2019). Till's influential text sketched out the deficiencies of the architectural community to fully commit itself to the advancement of architecture through academic research practices. Our unwillingness to institute genuinely architectural research owes to obsolete ideas of what academic research actually stands for, ungrounded ideas of the nature of architectural practice, and lack of confidence in the unique strengths of architecture as a design profession.

Our unwillingness to institute genuinely architectural research owes to obsolete ideas of academic research, ungrounded ideas of the nature of architectural practice, and lack of confidence in the unique strengths of architecture as a design discipline.

Evaluated from the Finnish perspective, Till touched upon an issue that has been a problem in architectural education in Finland for decades. Although the university environment has granted the discipline access to all the levels of academic degrees up to doctorate since 1908, architectural research has been only a marginal interest within the profession (Lapintie, 2009, 20,22). This is mostly because Finnish architectural education has been developed in the footsteps of the polytechnic framework where the curriculum has been optimised for the students' professional expertise and competence in the national job market rather than for a career in research or in the academia (Figures 1a and 1b).

Figures 1a and 1b. Finnish architectural education has been optimised for professional expertise and design competence; the ideal architect is still a lone creative and innovative form-giver rather than an informed problem-solver working in a team of experts. To the left: the drawing board of the acclaimed masters of Finnish modernism, architects Kaija and Heikki Siren, at work in their office in 1954, shows no signs of books or other reference material. Image source: KAMU Espoo City Museum / finna.fi. To the right: the principals of one of the leading architectural offices in Finland, ALA Architects – Samuli Woolston, Juho Grönholm, and Antti Nousjoki – are portrayed among the scale models of their designs at their office. Another photo on the company website shows a glimpse to an empty office library with bookshelves apparently stacked with architectural magazines. Photo: Tuomas Uusheimo; image derived from ALA Architects' website at ala.fi/who-we-are/profile/.

Yet, since the turn of the millennium, research skills have been regarded as increasingly important an element in the graduating architect's toolbox. Already in 1994, the implementation of the Council Directive (1985) about formal qualifications in architecture set standards for the architect's degree to include an understanding of the methods of investigation. The Finnish Government's Architectural Policy Programme 1998 called for a national strategy for architectural research and development (Korpelainen, 1999), and the accreditation of The Bologna Process in 1999 accelerated curriculum development towards an internationally comparable Bachelor-Master model. The implementation of the first productivity incentives in university funding in national educational policy in 1988, culminating in the 2010 university legislation renewal, has steadily steered Finnish university education – architectural education

included – to increase the amount of research outputs measured either with completed degrees, the amount of external funding, or the amount of scholarly peer-reviewed publications (Opetusministeriö, 2005; Pelkonen, et al., 2010; Seuri and Vartiainen, 2018, 102-103).

These developments have activated the three schools of architecture in Finland at Aalto University, Tampere University, and University of Oulu who established a joint national doctoral school in architecture 1995 (discontinued in 2001; Suomen Akatemia, 2004) and who, since 2009, have organised an annual Architectural Research Symposium (ATUT) together with the Finnish Association of Architects SAFA to promote scholarship and national research activity in the field. The amount of doctorates in architecture has increased (Figure 2), and contrary to the traditional master-apprentice teaching format (Nilsson and Dunin-Woyseth, 2012, 5; Mukala, 2009), even the academic recruitment policy now considers the benefits of doctoral degrees against mere practice-based competence in the faculty job openings. Today, the Master's programme curricula in architecture at all the three schools include at least some courses or seminars in thesis writing, theorisation, research methodology, and academic practices: at Aalto University (2022–24) a compulsory thesis seminar (3 ECTS) and a research course (6 ECTS); at Tampere University (2023–24) a thesis seminar (0 ECTS) and an optional writing course (3 ECTS); and at University of Oulu (2023–24) a compulsory research methodologies course (5–10 ECTS) and an optional information retrieval course (1 ECTS).

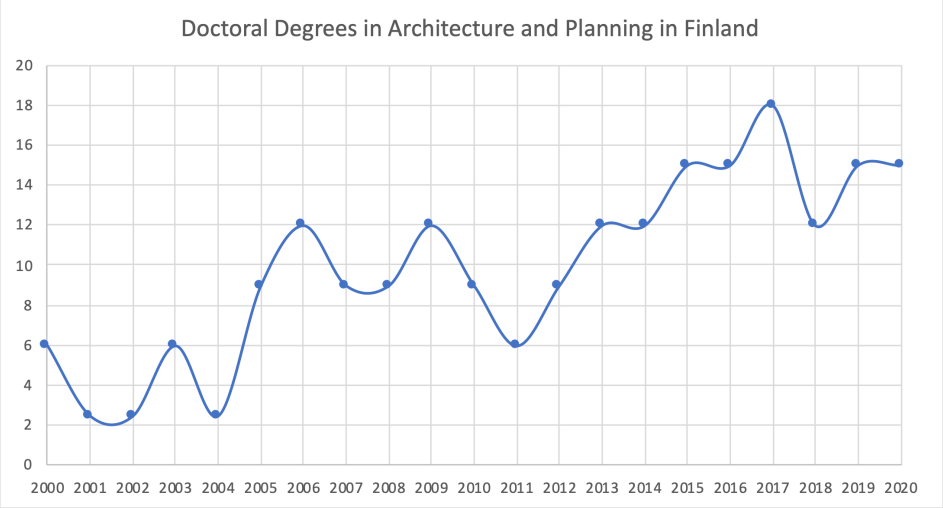

Figure 2. Completed doctoral degrees in architecture and planning in Finland 2000–2020. In 2001, 2002 and 2004, the number was announced as 1–4 due to data protection. Data source: Vipunen – Education Statistics Finland.

Despite the promising developments, however, there has been little discussion about curriculum development as regards research skills education for architects or what the pedagogical objectives of research courses in the degree programmes should be. The present paper argues that – in line with Till's (2005) observation that architectural research tends to either make architecture a some sort of a 'special case', or legitimise itself by turning to other disciplines for scientificity – research skills education for architectural students lacks a natural connection with the general objectives of architectural education and a comprehensive understanding of the up-to-date competence requirements of graduating architects. Already the rapidly growing requirements of environmentally responsive design discussed, for instance, in the white paper (Altomonte, 2009) for EDUCATE Action (Environmental Design in University Curricula and Architectural Training in Europe), or regional thinking needed to understand the factual, socio-economic and political constraints of architectural

design in dialogue between scientists and designers (Weizl et al, 2015) mount pressure on learning the basics of research thinking during architectural studies. Architectural research can thus no longer be rendered as something purely academic, strange, dreary, or irrelevant, not even for those who aim at a design career entirely. New professionalism in architecture is based on awareness, understanding, knowledge, ability, and cross-disciplinary communication competence, and thus extends beyond traditional professionalism governed by the long, formal university education, tightly controlled professional entry qualifications, and the self-regulating elements of the architects' culture (Milliner, 2000, 193-197).

This paper discusses a pedagogical experiment with Tyson Seburn's (2016) Academic Reading Circle (ARC) group work model which has been applied in a fully online environment on a compulsory Master's level research skills course at Aalto University, Department of Architecture since 2021. Initially, the model was adopted for testing in order to find feasible pedagogical tools to increase architectural students' awareness of the multifaceted epistemology of our profession and the many opportunities of applying and doing architectural research. Other factors in implementing the ARC model were to support peer-to-peer learning amongst the large group of students with various backgrounds (60–80 students per a sole teacher), to activate and engage the students in collaborative working, and to find a resource-friendly and feasible pedagogical solution for obligatory online teaching in the post-pandemic reality of higher education. This paper describes the experiment, some observations about the learning environment, and reflections on pedagogical philosophy that in the author's view work best in research education in the creative fields. The paper discusses the results of the experiment and reflects on ARC's advantages and challenges, and some ideas for further development.

Towards 'designerly ways of knowing'

The substantial incentives to increase research output during the last two decades have spurred the academia to question whether the idea of architectural research should be updated along with the expansion of research interests as regards urbanisation, developments in building technology, climate crisis, biodiversity, digitalisation, conservation and preservation of architectural heritage, or societal problems such as inequality, accessibility, capitalism, or methods of participation. The relevance of research skills and the need for field-specific pedagogy have been discussed, for instance, in the many recent suggestions to renew the concept of 'doctoratedness' and to develop practice-based, practice-led and research-by-design doctoral programmes for architecture (Nilsson and Dunin-Woyseth, 2012; Sağlamer and Erkök, 2015), or as in Denmark and Norway since 2017, even Industrial PhD schemes in collaboration with architectural firms and the academia

The turning points have been the detachment of the traditional concept of architectural research as applied science, moving on from the pointless technology versus art confrontation (in regard to Finland, see e.g. Katainen and Aura, 1997; Lapintie, 2009), the acknowledgement of a plethora of methodologies applicable to architecture (Rendell, 2004), and the recognition of the design disciplines such as architecture as "a collective body of knowledge that is unique to architecture and is not delimited in time or space" (Anderson, 2001a, 294). It is this epistemology, intellectual culture, and disciplinary identity – the "designerly ways of knowing" (Cross 2017, 163) – that research skills education should support and advance in architectural education.

The profession versus the discipline

Notwithstanding the keen interest in tackling real-world problems, or developing new academic practices in doctoral education, basic research skills education in Master's programmes in architecture has remained surprisingly normative and theoretical, however – at least in Finland. The courses tend to lay emphasis on the students' forthcoming thesis projects and consequently teach academic skills such as scientific writing, methodology, referencing techniques, theory building, and epistemology, but mostly with the objective to make success in the forthcoming thesis. Usually, the courses use other disciplines such as philosophy of science, human or social sciences, or lately also artistic research as frames of reference. Topical authors, theories and philosophies, especially within the framework of qualitative research methods, are also discussed.

The most effective or fruitful contact points between the academia and the praxis – the discipline and the profession – have remained undefined, however. Many practitioners, educators and scholars have identified the need to reorient the existing educational ideology altogether and to adjust the learning objectives to be more compatible with the actual needs of the industry, the society, and the professional community (e.g. Nicol and Pilling, 2000; Till, 2009; Graaf, 2017; Salingaros, 2017; Hollmén, 2020). On the other hand, it has been argued that in US universities where research methodology is rarely taught, students entering PhD programs in architecture have little or no research methods background (Moore 2015, 47). Although arts – and architectural – students have a creative identity for whom research practices may come as a shock (Hockey 2003, 83-84), the university degree obtained through a Master's programme should, after all, include research education that ensures the graduates' academic readiness for postgraduate studies. The educators have been left with a double-edged sword: graduating architects should have excellence in both practice and research, but these domains should not overshadow one another.

Successful and effective research education should focus on the students' sense of purpose and have a realistic, tangible connection to their understanding of the nature of their profession.

> *We want the profession to grow and become more articulate. We want professional practice to reach its highest standards. As researchers or professionals we want to make our own contribution to these enterprises. As educators we want to prepare the next generation to make their contributions in each of these areas.* (Anderson 2001b, 96-97)

The co-existence of two interest areas in architectural research education indicates a pedagogical problem, because one cannot serve two masters. Practicing architects have expressed an increasing need for research skills to respond to the calls for evidence-based design or to grow their businesses with funding opportunities from national R&D programmes up to EU's Horizon Europe or Creative Europe. On a smaller scale, national surveys about professional competence among the Finnish Association of Architects SAFA (e.g. Kangasoja, 2014) frequently mention information analysis, and oral and written argumentation skills in diverse linguistic registers – in short, basic research skills – among the respondents' top challenges for which they would also like to have further education.

Still, research courses suffer from students' low motivation and little regard for their importance. According to a comparative study amongst education and psychology students in Finland and the USA (Murtonen, et al., 2008), only about half of the students were convinced that they would actually need research and statistics skills in their future work. By the same token, as documented by (Earley, 2014, 245-246) in an extensive literature review of research methods education, many students entering a research methods course – despite the discipline – failed to see its relevance; had negative preconceptions about their competence; had low motivation; and their general attitudes towards research were poor or misguided. Hence, successful and effective research education should focus on the students' sense of purpose and have a realistic, tangible

connection to their understanding of the nature of their profession (Murtonen, et al., 2008, 609-610).

Research literacy education for both research consumers and research producers

How could course development address this apparent lack of success of current research education in the field of architecture? Modern textbooks about architectural research, which started to appear at the beginning of the 2000s, have taken the demystification of research, the context of architecture, and the epistemological enrichment of architectural practice as their starting point. Hougaard et al. (2016) introduces examples of applying artistic research methods; Lucas (2015) invites to explore the hands-on pragmatics of doing research; Samuel and Dye (2016) addresses architectural practitioners; and Sarvimäki (2018) explains the vast possibilities of case study techniques, to list a few. Although different in style and scope, these much-welcomed new publications on architectural research have expressed their motivation to lower the threshold between the academia and the industry whilst referring to architecture as a discipline with its own epistemology, professional history, and evaluation criteria.

In what has become the major reference book in architectural research methodology, Groat and Wang (2013, 3-4) acknowledge the shift in both the nature and role of architectural research: the number of doctoral programmes has increased; new research-based Master's programmes or research studios have been launched; new research-oriented programmes in architectural and environmental design fields are now available for students; and many architectural firms have reshaped their business ideas with research-related services (Figures 3a and 3b).

Figure 3a. Alusta Pavilion by architects and doctoral researchers Maiju Suomi and Elina Koivisto, 2022. The pavilion is an experimental research project located in the courtyard between the Museum of Finnish Architecture and Design Museum in Helsinki. The pavilion has served as a platform for empirical research on biodiversity in urban milieu through pollinator-friendly plantation and structures and a multisensory urban space. Suomi and Koivisto also have a mutual professional practice Suomi/Koivisto.

Figure 3b. R&D at White Arkitekter, Sweden. Many architectural firms, such as White Arkitekter from Sweden, have reshaped their businesses with research-related services or R&D programmes to develop the industry with new knowledge and more justifiable design propositions. Image source: Screen capture from https://whitearkitekter.com/rd-programme-2020-2023-informed-design/.

Architectural research courses could adopt the idea of 'architectural research literacy' as the starting point of their pedagogy and heed that there are both prospective consumers and producers of research among the learners.

Research as a new language

This new learning environment of architecture lays emphasis on the far-reaching significance to make a distinction between *consumers* and *producers of research* (Earley 2014, 242-243). The main difference between these two groups of learners is that future consumers of research should only need to be able to follow the research literature related to their field, whereas future producers of research need to be able to conduct research projects and therefore need a much wider introduction to literature, methodology, proposal writing, and other fundamentals. Although the distinction may be an oversimplification, Earley (2014, 248-249) suggests that one way to overcome this dichotomy is to use active learning approaches to teaching, provide exposure to various research orientations, and to advocate self-critical pedagogy that not only impacts student understandings, but also their attitudes towards research.

The viewpoint resembles the academic literacies model used, for instance, with linguistic minority students in higher education or thesis writing education (Lea and Street, 2006; Lillis et al., 2015), and which has also been applied as a loose pedagogical frame for the course discussed in this paper. The model is influenced by social and critical linguistics and pays attention to the cultural practices of institutionalised discourses, the social, cultural, and contextualised nature of academic practices such as thesis writing, and especially the multi-modal literary practices in professional contexts (Lea and Street, 2006, 376; Lea, 2016, 92).

Corresponding the concept of research literacy as the "ability to engage with existing research reports and to produce accounts of research" (Blaj-Ward, 2015, 365), architectural research courses could adopt the idea of 'architectural research literacy' and take the co-existence of both prospective consumers and producers of research among the learners as the starting point of their pedagogy. It is against this backdrop that the research skills course discussed in the current paper has undertaken the ARC model and its discursive format. Subscribing to a comprehensive understanding of human learning, the model falls in line with socio-constructivist learning theory and transformative pedagogical philosophy which understand learning as an epistemological change: the student not only learns new things about architectural research, but changes their understanding of how diverse the scope of knowledge in architecture is and how their individual abilities and inclinations fall in line within the diversity of perspectives of their peers (Kegan, 2018; Monroe et al, 2019; Mezirow 1997, 5; 2003, 62; 2018, 119).

The Academic Reading Circle experiment

Tyson Seburn's (2016) Academic Reading Circle (ARC) model is a role-based group-working method and it was originally developed for English language teaching to prepare international students for the reading and writing requirements of higher education courses at the undergraduate level. The model builds on earlier research about the benefits of traditional book clubs to engage learners with reading, and it combines reading, oral production, meaningful discussions, and collective sharing to establish a deep and personalised interpretation and comprehension of the studied texts (Seburn, 2016, loc. 48-79). The architectural research skills course discussed in this paper translated this idea into teaching architectural research literacy: similarly to any language learners, the students in an architectural research course are learning 'the language of science' and its cultural conventions.

The course setup

The syllabus of the course has aimed at familiarising students with the intrinsic features, methodological opportunities, and the multidisciplinary nature of design disciplines such as architecture. The course provides an understanding of the basic skills and key resources needed to follow the research scene, and to apply research methods and results critically and independently in their professional practice. The course also introduces students to scientific thinking, academic argumentation skills, and knowledge of good scientific practices. As encouraged by Earley (2014), the course's main target has been set to make an impact on students' attitudes so that research is not regarded as an academic agility course disengaged from praxis, but a revitalising, innovative and open-ended sector for the improvement of design performance, or even a career option.

Similarly to any language learners, the students in an architectural research course are learning 'the language of science' and its cultural conventions.

The course has paid attention to the varying consumer-producer profiles of the students: every student needn't be educated into a researcher, but every graduating architecture should have a basic understanding of information retrieval, source criticism, research ethics, and the difference between scientific and professional values. The course programme has also attempted to provide every student with opportunities for critical self-reflection and for critical-dialectical discourse with their peers and with course literature from contrasting viewpoints. Hence, the pedagogical rule-of-thumb has been to inspire students to exchange their views about academic practices, to wake their curiosity towards architectural research activities, to encourage them to navigate within the many co-existing scientific discourses, to explore the many possible ways to acquire and disseminate knowledge about architecture and architectural design, and most importantly, to promote their agency in the learning process.

The course is part of master-level architectural studies, but its participants regularly also include landscape architecture and interior architecture students, and also Bachelor and doctoral students (Figure 4). The course is taught online in English, yields six ECTS, is graded pass/fail, and spans over seven classes every two weeks. The average number of participants is between 60 to 80 students. The programme consists of the following elements:

- Seven biweekly classes on Zoom (à 2,5 hrs). These sessions include Q&As with visiting architecture scholars, recently graduated doctorates or architects who talk about their work or their theses. In addition to the Q&As, the classes also include mini lectures and exercises that practise e.g. information retrieval techniques from various search engines and databases, or compare differences between professional and scientific publications.
- Book reviews as group work. The groups choose six out of ten pre-listed course books that deal with architectural research methodology; these

book reviews follow the ARC model (analysed in detail below) and result in peer-reviewed reading reports.

- Six Moodle-based Quizzes performed one-by-one in-between the classes by the flipped classroom principle; open-ended questions that check out the students' preconceptions about the relation between academic research and architectural design practice, the relevance of a research plan, the significance of defining one's research concepts, the purpose of establishing one's theoretical frame-of-reference, research ethics, source criticism, and so forth.
- Six mini lectures (c. 25 minutes each) that explain and open viewpoints to the quizzes mentioned above.
- Text analyses that examine the structure of a research paper and the communicative strategies in scientific writing.
- Learning Diary about the Q&As with the visiting lecturers and the relevance of their talks to individual students (in 2021–22 course editions only).

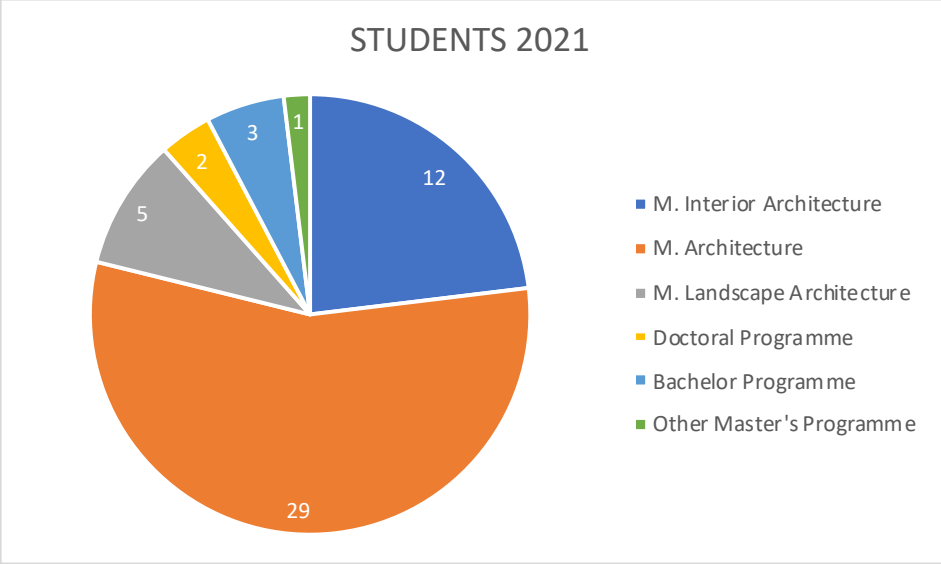

Figure 4. The division of the students in spring 2021 according to their major programmes. In 2021, there were 52 students in total; 56% were students in the Master of Architecture programme; 10% were other than Master's students.

Organisation of the ARC application

The hypothesis at the beginning of the ARC experiment was that modern textbooks on architectural research serve as excellent study material, and that structured, yet self-governed collective reading could create a meaningful social context to study the 'foreign language' of research and support building a personalised interpretation of both the course books and architectural research in general. In the earlier course editions, the students produced short home essays of the course books, which were then discussed at class. The main problems with this approach were the large amount of reading, lack of context, the solitary students' perfunctory relation with their study material, and the excessive workload on the teacher because of the large amount of essay analysis and class preparation.

It was for these reasons that an idea of collective reading entered in the picture. The course has implemented ARC's three main components (Seburn, 2016, loc.106):

1) The common text (here a book about architectural research methodology; one book per the period of two weeks).

2) Static study groups of seven students maximum; each group member has a specific role that circulate every two weeks.
3) The group work discussions published in the form of reading reports that are peer-reviewed.

The ARC roles and their descriptions and guiding prompts were somewhat adjusted, and to diversify group work intensiveness, a new role of The Presenters was added (Figure 5). The groups circulated the roles on every round so that each student could receive as many perspectives to the book and collaborative reading as possible. The groups were also encouraged to do their own adjustments to the roles if they wanted, or in case of absence, and to organise their internal communication as they saw fit (face-to-face meetings, WhatsApp, Telegram, Teams, Zoom, shared Miro boards, Google Docs…). To enable a friction-free start, the teacher assigned the leaders for each group on the first round. From there on, teacher interaction was kept at minimum, but the students were consistently encouraged to contact the teacher if there was anything unclear or any situations or problems that the groups could not solve by their own. The response time to these inquiries was kept as short as possible to create an atmosphere of appreciation and remote surveillance.

ARC by Seburn (2016)		**Course Adaptation (2022 edition)**
The Leader (1)	(...) establishes a group agreement on key points and facilitates discussion.	(…) chooses the book, prepares the group for each theme by introducing meaningful sub-questions, assigns the roles, organises and manages the group work practicalities, and reports their experiences on a special Leader's report.
The Contextualiser (1)	(...) explains why the author refers to people, dates, places, events, or outside sources for support.	(…) collects and researches reviews and commentary about the book in relation to each Theme.
The Visualiser (1)	(...) uses graphical interpretations to improve understanding of challenging concepts or language used.	(…) analyses the book's use of graphics in relation to each Theme.
The Connector (1)	(...) creates meaningful connections between text concepts and familiar situations.	(…) collects the group members' previous experiences of the things they have read, other courses they have taken, or any other ideas that come up in the group's discussions in relation to each Theme.
The Highlighter (1)	(...) focuses on the vocabulary and the book's language use.	(…) analyses the book's language use in relation to each Theme.
The Presenters (1–n)		(…) draw(s) together their group's discussions and submits their group's report to each Theme.

Figure 5. The ARC roles and their application. In the ARC model (Seburn, 2016, loc.106, 293–814), each group member has a specific role that contributes to group working.

The books and the study themes

As mentioned above, the pedagogics of the course subscribed to the ideal of teaching research literacy (Blaj-Ward, 2015) and rested on the assumption that recently published books on architectural research and research methodology provide accessible, comparable, lucid, and digestible study material for students. The selection of course books was based on three criteria: 1) the book was relatively new and available as an e-book for online accessibility; 2) the book had reached a stable status in architectural research discourse; or 3) the book

approached architectural research in a unique way or complemented to other books in an enriching manner. The broad variety of course literature would also provide a useful book list for students' own projects after the course if needed.

In 2021–22, the ARC course editions used the following books in the reading circles (in alphabetical order):

1 Groat, Linda N. & David Wang. *Architectural Research Methods*, 2nd. ed. Ebook Central Academic Complete International Edition / Wiley, 2013.
2 Hougaard, Anna Katrine, Martin Søberg, Kristine Annabell Torp, Elisa Lorentsen, Christoffer Thorborg, and Louise Grønlund. *Refractions: Artistic Research in Architecture.* Copenhagen: Architectural Publisher, 2016. This book was not available in e-book format, but was included in the book list for its unique contents.
3 Lucas, Ray. *Research Methods for Architecture.* EBSCOhost Ebooks / London: Laurence King Publishing, 2016.
4 Martindale, Katharine A. *Research for Architectural Practice.* Taylor & Francis eBooks Complete / Routledge, 2021.
5 Samuel, Flora, and Anne Dye. *Demystifying Architectural Research.* O'Reilly Online Learning: Academic/Public Library Edition / RIBA Publishing, 2019.
6 Sarvimäki, Marja. *Case Study Strategies for Architects and Designers: Integrative Data Research Methods.* London: Routledge, 2018.
7 Schrijver, Lara (ed.) *The Tacit Dimension: Architecture Knowledge and Scientific Research.* Leuven University Press, 2021.
8 Sharr, Adam. *Reading Architecture and Culture: Researching Buildings, Spaces and Documents.* Ebook Central Academic Complete International Edition / London: Taylor and Francis, 2012.
9 Stender, Marie. *Architectural Anthropology: Exploring Lived Space.* Taylor & Francis eBooks Complete / Routledge, 2021.
10 Vernooy, D. Andrew; Jenny Olin Shanahan, and Gregory Young. *Undergraduate Research in Architecture: A Guide for Students.* Taylor & Francis eBooks Complete / Routledge, 2021.

The Leaders of the groups chose one book to study in their group, and each two-week study circle focused on one particular theme:

1 **Target Audience.** How does the book define its default target audience? Analyse how this shows in the contents, text, images, style, layout etc.
2 **Publication Motivation**. What reasons does the book give for its existence? Why has this book been published? Analyse its raison d'être and how it shows in the book.
3 **Understanding of Architectural Research**. How does this book define architectural and/or design research? Analyse the book's research conceptions.
4 **Portrait of a Researcher**. What kind of a portrait does the book paint of the researcher? Analyse the book's ideas of scholars and designers and how their work is characterized.
5 **Cultural Applicability**. How applicable is the book to various cultural situations? Do its core ideas translate well into various contexts (e.g. Western/Asian, global/regional, or architecture/landscape architecture /interior architecture). Is the book generic or specific?
6 **Usability**. How does the book meet the reader's need for information? Analyse the contents both from your own and the expected target audience's point of view.

The overall configuration of the ARC model is summarized in Figure 6.

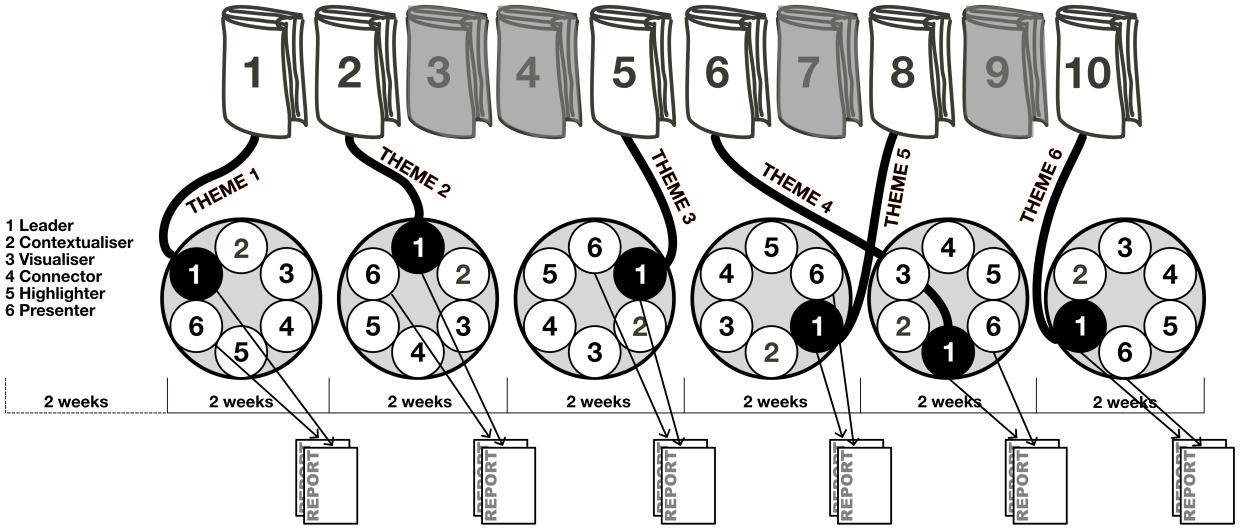

Figure 6. Configuration of the ARC model. The students are divided in static study groups of optimum six, maximum seven members. Each group member has a specific role – 1) The Leader, 2) The Contextualizer, 3) The Visualiser, 4) The Connector, 5) The Highlighter, or 6) the Presenter(s) – for one study cycle, i.e. a period of two weeks, after which the roles change. Each group studies one book – each group their own, chosen by the current group Leader from the ten pre-selected course books – against one theme – the same for all the groups. After each study cycle, the group delivers two reports: one compiled by the Presenter about the group's interpretation of the book from the perspective of the Theme; the other by Leader about their leadership experience and the internal working process within the group. The book report is peer-reviewed at class; the Leader's report is commented by the teacher. A new two-week cycle begins with a new book, new theme, and new internal group roles. At the end of the course, each group has studied six books (here in this example, books 1, 2, 5, 6, 8 and 10) from six perspectives.

Results

The rigorously structured ARC model provides an efficient framework for online group working as regards analytical and discursive reading.

The experiment indicates that the rigorously structured ARC model provides an efficient framework for online group working as regards analytical and discursive reading. ARC's carefully defined, circulating roles were the biggest benefit for efficient group work: online group working with random people can be socially and psychologically demanding, but clear leadership, the dispersed responsibilities, circulation of roles, and the groups' full self-governance cut short the usual downtime to get things running and to keep everyone involved. The ARC model also simulated a real-life setting of professional life: each group member is actively contributing to a larger whole. The number of dropouts was also lower than before the ARC experiment (three students versus the usual six to nine students prior to the experiment) and each of the dropouts contacted the teacher to explain why they could not continue. This indicates commitment to the course and sense of togetherness higher than usual.

However, group work was not successful for everyone: some students commented on poor internal communication within their group and that towards the end of the course, the working mode became monotonous, and the initial excitement faded. This was addressed on the second edition of the ARC experiment: the group leaders of the fourth reading cycle were asked to make an intervention and to explicitly change some of the established working habits and to have a roundtable discussion of the group members' experiences so far. This was a highly welcomed manoeuvre: all the group reports commented on the positively stimulating change in the atmosphere even though there had not been any problems.

Student feedback

The following reflections are derived from the group reports and the final course survey[8] as regards the ARC experiment. The students were informed about the collection of feedback data for research purposes orally during the course; the responses discussed here in this paper were selected on the basis of their general representativeness. On a general note, the feedback was highly positive, but noticeably more polarised than before. The feedback that indicated a less than satisfactory overall assessment addressed especially the impression of complexity of the ARC model. It should be also noted that there was little feedback about the course being taught remotely. On the contrary, many students commended the option to participate the classes online and meet their group peers face-to-face if opted in. Some students commented that towards the end, group working became too repetitive to engage with, and that the group dynamics was not always optimal.

> Maybe changing the group work to something more creative and less repetitive (Survey / Suggestions for course development)

> Later session[s] start[ed] to become repetitive, although the question [was] different., and this problem not only caused by the task itself but also the atmosphere among the group members (Survey / Feedback about ARC)

Group working with the books was regarded as rewarding. Many students specifically commended the ARC system and especially the use of dedicated roles. These notions echo the theory of meta-connective pedagogy proposed by Dreamer (2019): the learner's awareness of the multiple, varying connections to knowledge disseminated by both people and artefacts (books) created new, emergent meanings:

> The book review introduces various books in a short time and forces us to get familiar with different type of research related text. Doing the group work with a great and smart group was enjoyable and the workload was distributed well. (Survey / Feedback about ARC)

> I think the discussion part really showed me how important it is to reflect back on to what we have read. I learned about the other chapters through a conversation with the other team members. This helped me to learn from their experiences and ideas. I think the important teaching here is that it is crucial to talk about the work we are doing and have some peer-review and support. (Group 6 Report 6)

> The book review introduces various books in a short time and forces us to get familiar with different type of research related text. Doing the group work with a great and smart group was enjoyable and the work load was distributed well. (Survey / Feedback about ARC)

> To my mind the method succeeded perfectly. I think it makes a lot of sense when working with groups. Everyone has one´s own role and it

[8] Aalto University has an automated, anonymised course feedback system that has eight standard questions. They evaluate e.g. the students' overall satisfaction with the course; the teaching methods; the student's own assessment of their study effort; the ECTS-workload ratio; the student's estimate of their attendance level; the course content and objectives correspondence; and include an open-ended field to give ideas for further development. For the ARC experiment, I added one extra open-ended question to collect specific feedback about the ARC model. The survey excerpts quoted in this paper are from the reading reports, Leaders' reports, and the overall course development suggestions and the ARC-specific comments in the course feedback. The use of this anonymous data for research purposes was frequently made explicit during the course implementations.

> helps browsing the books from one point of [view]. When you repeat the method many times, you learn to read analysing. (Survey / Feedback about ARC)

One of the most inspiring findings was to see how empowering a role the dedicated leadership played in the students' self-development. Many students reported that they would never have taken the role of the group leader voluntarily. This is striking in reference to architectural education where the graduates are expected to take professional responsibility over real design projects and their teams in their working life.

> I had never been a team leader before… I felt the difference between being responsible for my own contribution and being responsible for the outcome as a whole. I think it helped me feel freer, have more control over future work processes, and be more proactive in a future project. (Leader / Round 5)

Within the tight timeframe of only two weeks per book, the leaders' grip on their task became crucial:

> As the leader a lot of pre-deadline thinking was required: How to organize the group together? Which documents would be the bare minimum to organize the group but not to create confusion or work in vain? How to make sure everybody gets a role they want? How to narrow down questions and pages so that people have time to read them? (…) How to leave everybody space to do the work in their own ways, yet have the presentation ready? How many reminders make sure that people remember but are not irritated? After this planning, all went well. (Group 1 Report 1)

> The system leaves quite a lot of freedom to the group: unfortunately in practice, this resulted in a situation, where our group didn't discuss together that much, but everyone read the book alone and the Presenters compiled the presentations from separate pieces. (Survey / Feedback about ARC)

> I find the main thing [was to] start thinking about the themes, recognize them in the books and to gain new perspectives on them – not to make the perfect coherent report. (Leader / Round 2)

> In our last book review meeting I wanted to interview my group members about this whole group work, their feelings and experiences about it. And as I had experienced the group work being illuminative in many senses so had many others in our group. Everybody [has] liked the zoom meetings even though some of us were very sceptical about it at first. Ten persons' informal zoom meeting was assumed to be an awful mess. Meetings have been lightly structured but still open conversation related to the book, course, weekly questions, and generally architectural research. (Group 4 Report 6)

From the teacher's perspective, the implementation of the ARC model was a game changer. The student/teacher ratio (60–80 students per one teacher) of this course and the online teaching format set limits to feasible pedagogical alternatives. On the other hand, the pedagogical development of architectural research education was imperative. The biggest, although also most rewarding challenges of the ARC model were its pedagogical modification from language learning to research literacy, and the pragmatics of course planning (role design, thematization, choosing the course books and ensuring their e-book licences, deciding on the reporting requirements, and so forth). The most time-consuming

element was setting up the Moodle learning platform (writing instructions and guiding prompts, setting up groups), so competence in Moodle and general interest in applying Moodle's versatile features were definitely an asset. Once the course setup was done, however, and although student emails were prioritized over anything else, teacher workload during the course was surprisingly low. Actual group working during the course run by itself, and teacher time could be devoted to the other course elements such as class preparation and for enjoyable reading of the groups' biweekly reports.

Discussion

This paper has presented a pedagogical experiment that applied Tyson Seburn's (2016) ARC model for group reading methodological literature about architectural research in an introductory master-level research course at Aalto University, Department of Architecture. To summarise, the ARC model proved to be a resource-efficient method to expose a large group of students to a large amount of text in a relatively short time. Regarding the objectives to increase architecture students' research literacy, the ARC model can be regarded as a highly useful technique to introduce students to a variety of literature in an efficient and analytical manner. The particular strength of the ARC model is that it transforms reading into a collective book club-like experience: role division, thematic approach, internal group discussions, and the joint effort to produce the reading report appeared highly meaningful to the students. The reading circle approach also supported accumulative knowledge-building, as each round, each new role-division and each new book brought about a new angle towards both the reading experience and architectural research in general.

According to the students' feedback, the ARC model has many promising elements that can increase students' positive attitudes towards research, improve their academic literacy, enhance peer-to-peer learning, and support student collaboration so valuable especially in an online learning environment. On the basis of the groups' reports and some random oral feedback afterwards, the students' self-governance of their learning and the way the ARC model lets the students to self-contextualise architectural research to what they have already learned about architecture during their studies are something that was regarded most highly and should be examined in more detail. From the teacher's viewpoint, the ARC model did not have any specific challenges to course design or online class management beyond the initial course setup.

However, the experiment shows that supporting constructive group leadership and facilitating organised intergroup discussions at the joint class sessions should not be neglected. ARC is itself an intensive mode of working and it does not have room for freeloaders. In the fresher course editions, the overall course setup is leaner and more simplified, the thematization has been made more varied to increase the dissimilitude of the reading cycles, the objectives of group work and the reports have been made more explicit, the group size has been limited to six members, and the descriptions of the roles have been clarified and made more flexible. Moreover, the course has now implemented a 20-minute peer feedback session in the Zoom breakout rooms (two groups/10 minutes in each; preparation time c. 48 hours) and a closing, shared 'braindump' on Flinga online whiteboard where everyone can anonymously comment on the past reading cycle and its learning outcomes.

The first impression of these revisions is highly positive: the students now have full command of their work from start to finish, and they can air their opinions both on the book they have just studied, their role whilst studying it, and the feedback they have just received openly. A teacher-facilited discussion which was previously used to catch up with the groups at class only gave an impression that there is a 'correct answer' to how the books or the themes should have been

understood, or how the reading report should have been written. This was quickly doomed to be counter-productive to the principles of socio-constructivist learning subscribed here: the learner actively builds up their cognitive capacity in interaction with others. When dealing with creative and cognitively demanding professions such as architecture the lesser that other is a representative of an institution the better.

This paper has argued that the prevailing models for research skills education for architectural students lack a natural connection with what professional architects actually do and need, and what kind of research competence contemporary research initiatives in the field of architecture might actually call for. The course experiment indicates that the ARC model can be a game changer in research education and teaching academic research literacy in the field of architecture as it – whilst activating analytical reading skills, new knowledge about research methodology, and efficient argumentation through report writing – operates intrinsically within the advancements of architectural research and embraces individual students' creative agency in the learning process.

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