ORIGINAL PAPER

From art-science to art-science-in-the-making: transcending boundaries in higher education by (de)constructing them

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Abstract

In Latour's book *Science in Action*, readers are encouraged to use science-in-the-making as an entry point for understanding science instead of reinforcing the stable reality of ready made science. Building on his work, this study employs an art-science-in-the-making approach to trace how a new art-science initiative is helped into being. The ethnographic work centers on the development of an interinstitutional dual degree program between two art schools and a university in Rotterdam, the Netherlands. Particular attention is paid to the ways in which mundane, bureaucratic practices feed into the stabilization of the new art-science initiative. Too often, these practices remain outside scholarly discussions on art-science. This article argues that being attentive to the practices of "paper shufflers", to borrow Latour's terminology, aids our thinking through encounters across difference. The *modus operandi* of holding the new intersection together is conceptualized as a mode of syncretism of continuous repair. This modality of being together points to the tendency not to avoid disruptions or threats, but to continuously attend to them anew.

Keywords Art-science · Actor-network theory · Higher education · Boundaries · Audit culture · Ethnography

Introduction

Art-science collaborations are appearing often enough that one has begun to speak of the "emergent field of art-science" (Born and Barry 2010, p. 103). The 'two cultures', to use Snow's (2012/1964) infamous expression, are held together and kept apart only still by a hyphen. In this study, I close in on the hyphen. That is,

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on the diverse and situated socio-material practices required to stabilize the relation between art and science. To trace these practices effectively I must catch them in movement, in that "fleeting moment when new associations are putting the collective together" (Latour 2005, p. 159). Therefore, equipped with an ANT[1] "repertoire" (Mol 2010, p. 261), I focus on the coming-into-being of a new art-science collaboration between three higher education institutions in Rotterdam. The construction site of art-science overflows with trials, uncertainties, regulatory conflicts, and frictions. The dust has not yet settled, which is key, because once everything falls into place, the practices and objects that stabilize the new collective disappear from view.

Art-science initiatives, both in theory and in practice, are generally regarded as valuable pursuits (Rödder 2017, p. 94). The consensus wanes, however, once the discussion turns towards where and how this 'value' is to be discerned. Some argue that encounters between artistic and scientific practices can "bring lay knowledge and embodied experiences from outside the gamut of science into the frame" and "forge coalitions of collective engagement" (Randerson et al. 2015, p. 23). Other scholars speculate that these hybrid collaborations can reinvent possibilities for political engagement (Gabrys and Yusoff 2012, p. 20) and that the potentiality of the arts can aid the "integration and mobilization of multiple kinds of knowledge, imagination, and intelligences" (Galafassi et al. 2018a, b, p. 68). Then there are scholars interested in exploring the possibilities of 'bringing in' the arts to aid or improve an academic learning process (for an overview see Van Baalen et al. 2021, pp. 12–13). Similarly, the arts have also been enrolled in the visualization of academic findings. The enhanced communicability of the findings should meet aspirations of 'more accountability' of publicly funded science. The final examples often fall prey to criticisms of instrumentalizing the arts and an incorrect conception of *science* as complete and finished "only to be communicated, understood or applied, while art provides the means through which the public is mobilized or stimulated on behalf of science" (Born and Barry 2010, p. 105).

Altogether, these varied and sometimes contradictory arguments can be understood as a multivocal call for the reconciliation of the arts and sciences and for productive border crossings of different kinds in general. The urgency of the reunion is stressed by Nicolescu (2018, p. 78), one of the key thinkers in the field of transdisciplinary theory, when he writes that "[e]verything must be done" to reunite the arts and sciences "so that they will move beyond to a new transdisciplinary culture". Although the precise locale of the rendezvous often remains unspecified, education (in all its generality) is always a prime subject in addressing all kinds of societal ills. The reconciliation of arts and sciences is no exception. Snow, and many after him, have identified "education as the foundation for the formation of the two cultures, and thus, the place for the reunion to occur" (Buntaine 2014, p. 4). It therefore

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[1] Even in the introductory paragraph, I choose to refer to the acronym ANT instead of Actor-Network Theory. With this decision, I aim to draw attention to the word "repertoire", as it is used by Annemarie Mol (2010), instead of the word 'Theory'. In this study, my understanding and usage of ANT primarily influenced by Latour's *Reassembling the Social* (2005) and Mol's (2010) reflections on the term in the *Kölner Zeitschrift für Soziologie und Sozialpsychologie*.

feels justified to mobilize an educational program as a case study in this article. In a similar vein, Nicolescu (1997, p. 4) argues (in his article titled *The Transdisciplinary Evolution of Education*) that contributing to the elimination of "the tensions menacing life on our planet, will be impossible without a new type of education". Their stirring texts come with a sense of urgency and immediacy. They know that the spaces for art-science collaborations are not a given. That is worth mentioning because case studies focusing on art-science often depart from the point where 'the space' for the project appears as the undisputed stage on which artists, scientists, and other actors (may it be educators, citizens, or policymakers) go about their business. I would like to acknowledge the valuable contributions such case studies have made, but their attention to the affairs 'on the stage' oftentimes leaves the stage unquestioned.

In this study, the fact that the stage is stable enough to perform on (to push the metaphor a bit further) is precisely what demands an explanation. The aim of this research thus becomes to describe how art-science is achieved.[2] That is not to say that my study precedes those articles who regard 'the space for art-science' as the backdrop of their affairs. Art-science is performative in nature: it is "not a building in need of restoration but a movement in need of continuation" (Latour 2005, p. 38). Thus, the movement continues while and because the 'affairs' take place. This shift in register allows entirely different phenomena to come to the foreground, seemingly uneventful practices are now pulled into the discussion of art-science and surface as key stabilizers of the new assemblage. With this approach, I clearly take inspiration from Latour's (1987) well-known book *Science in Action*. In his text, he encourages the reader to use science-in-the-making as an entry point to understanding science instead of reinforcing the stable reality of ready-made science. The entry point I propose here, in a similar fashion but upping the convolution of the term, is then: art-science-in-the-making. In this case, the hyphen between the arts and sciences does not exist *ex nihilo*, nor do changes in modes of knowledge production occur through 'scientific revolutions' or a 'transdisciplinary evolution', but rather through the situated and arduous work of "paper shufflers" (to echo Latour 1986, p. 26).

In the next section, I paint the contours of my research context by situating the Rotterdam Arts & Sciences Lab in a historical and theoretical context. This is followed by a presentation of my fieldwork. In the empirical section, I describe the chain of translations required to bring into being an interinstitutional Dual Degree program. Art-science then emerges as the perilous movement of transcending *and* reaffirming institutional boundaries. In my discussion, I conceptualize the *modus operandi* established to stabilize the new art-science intersection as a "mode of syncretism" of continuous repair (Law et al. 2014). Finally, I conclude with a suggestion as to how my study can further our thinking through and orderings of art-science.

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[2] To speak of an "achievement", here, means that art-science is not to be regarded as an "undisputed starting point but the provisional achievement of a composite assemblage" (Latour 2005, p. 208).

Setting the scene

My study takes place within the Rotterdam Arts & Sciences Lab[3] (hereafter referred to as RASL): a consortium between Codarts University for the Arts, Willem De Kooning Academy, and the Erasmus University Rotterdam. The institutions found each other in the recognition that today's "complex and multidimensional challenges", as their website puts it, must be defined and addressed in a creative, more-than-disciplinary manner (Dual Degree, n.d.). In that sense, they ideologically align themselves with scholars such as Gabrys and Yusoff (2012) and Galafassi (2018, p. 3) who stress the 'paramount' importance of a further engagement between the arts and sciences to enrich the imagination and "widen the range of problem framings and their solution space".

RASL's conception should be understood in the larger light of scholars seeking to 'bring together' the arts and sciences. The calls of academics alone are however not enough to realize the reunionist ambitions. To some degree, they must find political support. Therefore, it is worth noting that in the Dutch higher education landscape similar-enough sentiments[4] were expressed by politicians, policymakers, and educators alike. The Ministerie van Onderwijs, Cultuur en Wetenschap (2019, pp. 8, 19), for example, stressed the necessity for more collaboration between higher education institutions, and the development of flexible curricula in which courses from vocational and academic degree programs could be combined. On a similar note, the *Association of Universities in the Netherlands* (2017, p. 4) underlined the importance of more flexibility and student agency in curriculum creation. Each call comes with its own history and specificity, yet together they indicate a current towards the need for 'more outreach and collaboration'. Considering this diverse ensemble, it becomes understandable how a consortium, spurred on by ideas of co-creation, a richer conception of knowledge, and an awareness for the 'more-than-rational' (Galafassi et al. 2018a, b, p. 73) could take root and find institutional as well as political interest and support.

Before I can take on the task of closing in on the hyphen, however, I need to be more precise in demarcating the scope of my study. One of the ambitions of the RASL consortium was to offer a dual degree program (hereafter I will refer to RASL's dual degree program as the Dual Degree program). This is the project that

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[3] *Science & Technology Studies* has a long history of following scientists into their laboratories. The name of my research context suggests a prolongation of that lineage. RASL is however no 'ordinary' laboratory. In recent years, the word laboratory has gained traction in new contexts, away from its initial sterile surroundings, white lab coats, and elaborate technologies. Under a variety of denominations (e.g., field lab, living lab, urban lab) the laboratory has been reinvented as a place that promises innovation, cocreation, and experimentation in 'real-life contexts'. It is within this new tide of laboratories where RASL can be located. My research does not necessarily concern itself with the more recent manifestation of 'the laboratory'. But I am interested in RASL as a *laboratorium* in the more literal sense, as "a place for work and labor".

[4] I write "similar-enough sentiments" because an exact correspondence is of course not necessary nor possible. It can be argued, however, that one should be able to discern enough opportunities to frame one's initiative within the terms of the audience concerned. To use Suchman's (2000) words, one should be able to make a *persuasive performance*.

takes center stage in my study. It is a project where institutional boundaries become uncertain, where different curricula collide, and employees work hard to establish new interconnections. This messy encounter presents an excellent opportunity to "learn from [the actors] what the collective existence has become in their hands [and] which methods they have elaborated to make it fit together" (Latour 2005, p. 12). In good ANT fashion, the "actors" (see Mol 2010, pp. 255–257) brought to the fore in this study are a motley crowd. In much social sciences research, the pull of face-to-face interaction is hard to resist as a data gathering opportunity. But STS research in general, and ANT in particular, teaches researchers to be wary of the phonocentric reflex (see e.g., Van Oorschot, 2021, pp. 137–139). Operating from that tradition, I try to appreciate how art-science is achieved not or not only because its human members come to a shared 'worldview', but rather by attuning myself to the forms, classifications, and documentary practices that circulate at the art-science construction site.

The Dual Degree program presents students with the opportunity to simultaneously pursue an artistic as well as an academic degree.[5] The binary distinction between vocational and academic degrees, in the Dutch educational system, does not readily proffer this trajectory. In the Netherlands, as in many European countries, there is a parallel system of degree-granting institutions: there are vocational, or applied, institutions (known as *hogescholen*) and academic institutions. Art education is part of the former. As a result, the choice for the one practically excludes the other. Despite the unwelcoming structure to pursue an academic as well as an artistic degree, there always have been students who embarked on this journey. Under those circumstances, overcoming the hurdles posed by the binary structure was, primarily, the responsibility of the individual student concerned. This is where the Dual Degree program stands out: the coordination between the different degree programs and the three institutions is managed by *the work group*.

Modes of organizational ordering, as Suchman (2000, p. 314) writes, include the "generation of particular places in which monitoring, reflection, and decision-making are said to take place". The work group, understood as such, is the place concerned with the day-to-day operations. The group consists of four members, and they report to an 'academic board', which in turn reports to a steering committee. In organizational charts, that often accompany the conception of such working structures, the work group finds itself at the bottom, connected by a line upwards to the academic board, and on top of the diagram sits the steering committee. These places are essential to organizational knowing and action. At the same time, their very existence (and their charted visualizations) adds to the legitimacy of the project they are trying to help into being. The practices of the work group determine the scope of my research. During the 2019–2020 academic year, I have traced their concerns, documents, and practices to come to a better understanding of how art is hyphened to science.

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[5] Moreover, the RASL Dual Degree program does not only offer students the opportunity to simultaneously pursue an artistic and academic degree, but it also presents students with the opportunity *not to do so*. Formerly, both decisions were an impossibility within the Dutch educational landscape.

The day-to-day operations of the work group consist of many different, often-times bureaucratic tasks. Examples of these tasks are transferring grades from one institution to another, preparing documents for examination committees, and sharing information about the Dual Degree program with teachers, students, and staff alike. This medley of responsibilities has two characteristics that deserve elaboration. First, they are always situated between and within different communities of practice. The work group operates in an "intermediate domain" (to speak with Galison 1997, p. 46). They find themselves at an intersection between different quasi-stable communities of practice. Such an intersection (a metaphor also used by Galison 2010, p. 32), of course, does not have an a priori existence but is both the product and the home of the encounter between different institutional realities, ideas, degree programs, objects, and people. The second characteristic is that it concerns precisely the type of work which for many academics would appear superfluous to their "real work" (Shore and Wright 2000, p. 73); a brush-off which may partially explain the lack of attention for the role of more mundane, bureaucratic practices in scholarly accounts of art-science collaborations. Inspired by ANTs emphasis on symmetry[6] and, more generally, STS interest in "studying boring things" (Star 1999, p. 379), I allow everyday things (think of ECTS, representations of curricula, and grading management software, etc.) to become the main actors in my empirical telling of how art is hyphened to science.

In the previous paragraphs, I have sketched the contours of my research context but the scenery would not be complete without paying attention to "key events in the academic calendar" (Shore and Wright 2000, p. 73): audits. The *Accreditation Organisation of the Netherlands and Flanders* (NVAO 2018, p. 6) describes an audit as a "periodic, external, and independent assessment of the internal quality assurance in place at an institution". The degree to which audits live up to their promises of greater quality, accountability, and efficiency is highly contested (Power 1997; Shore and Wright 1999, 2000; Strathern 2000). In practice, audits appear as carefully staged events, "formalized, choreographed, [and] theatrical" (Shore and Wright 2000, p. 72). As such, they present themselves as, aesthetically as well as practically, appealing opportunities for data collection for interested researchers. My study is related to and forged by audits, inspections, and visitation committees but it takes place *in anticipation* of these key events. My study is always situated after *and* before the audit. What dictates the sense of urgency of the work group, what determines the order of the discussion points on their agenda is the looming prospect of the audit which is never far away at one of the institutions.

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[6] The usage of symmetry within ANT (see for example Latour 2005, p. 109 or Law 2004, pp. 101–103) is a continuous loan from David Bloor's *Knowledge and Social Imagery* (1991).

Curriculum-building at an intermediate domain

On the second floor of Erasmus University College, towards the end of the hallway but just out of sight, one can find *room 17*. At the beginning of my fieldwork, the room was renamed the 'RASL room'. An A4 paper taped to its glass door confirmed the new name. The name-change indicated a repurposing of the room from a class-room to an office space. The row of individual desks, organized in a rectangle fac-ing a *Smart Board*, and the accompanying fourteen colorful classroom chairs from the upper echelon in their product category, made place for four large desks and comfortable looking, but tough to operate, office chairs. The newly installed desktop computer took over the power outlet previously occupied by the *Smart Board* and only the occasional student who barged in, "oh, I thought my class was in here", reminded the employees of the Dual Degree working group of the previous use of *their* space.

The RASL room, seemingly falling outside the jurisdiction of the *clean desk policy*, soon became populated with posters representing a variety of curricula in eye-catching color combinations, copies of numerous 'rules and regulations', drafts of RASL brochures and related recruitment materials, and of course the well-known composition of uncleaned coffee mugs. Latour (1986, p. 26) was right when he com-pared the bureaus of the Prussian bureaucrats to "a small laboratory in which many elements can be connected together". Room 17 was the command-and-control room, if you will, where attempts at establishing and securing connections proliferated. In proper ANT terminology, I could describe it as a "star-shaped oligoptica" (Latour 2005, p. 182). Regardless of the denomination, however, it is the place where I spent much of my fieldwork and where the empirical section of this study should take off.

One of the posters, gracing the walls of room 17, depicted a rudimentary repre-sentation of the composition of the Dual Degree curriculum. I plan to use this visual (see Fig. 1) as a jumping-off point for my story. However, before I do, allow me to revisit what the Dual Degree program entails. The Dual Degree program offers stu-dents the opportunity to simultaneously pursue an artistic degree (at either Codarts University for the Arts or Willem De Kooning Academy) and an academic degree (at Erasmus University Rotterdam). It is the place "where arts & sciences meet", as the RASL website would have it ("RASL," n.d.). Normally, the study load of the two programs together would amount to 420 European Credits (ECs). That makes for 7 years of study. The Dual Degree program, however, makes it possible to com-plete both programs in 5 years' time. Of course, this begs the question: How do they do this? I will begin by recounting the first explanation I got during my fieldwork. This explanation, I should note for a final time, does not mobilize grandiose stories about 'the encounter between the arts and sciences' or between the 'two cultures', but rather "deflates" (to speak with Latour 1986, p. 3) those powerful dichotomies and attunes us to modest and practical engagements with document and categories that will ring familiar to those working in education.

The rectangles in Fig. 1 represent different degree programs. Panel A and B rep-resent the academic degree program, panel C and D represent the artistic degree pro-gram. A Dual Degree student would follow panel B (at the university) and panel C
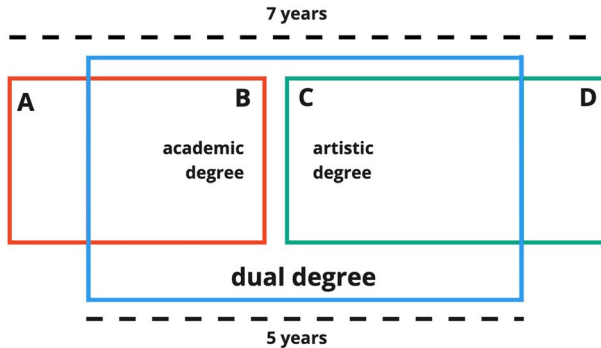
Fig. 1 A visualization of RASL's dual degree program

(at the art school). Panel B and C are thus the 'actually followed courses' by a given Dual Degree student. This results in the first task for the work group: They must find 60 ECs in each program which can be omitted. The interknitting of the Dual Degree program becomes more puzzling, however, when it turns out that Dual Degree students do not graduate with 300 ECs (i.e., the 'actually followed courses'). Instead, their diplomas show 180 ECs obtained at the university and 240 ECs obtained at the art school. This is the case because 60 ECs from the artistic degree program (from panel C) are transferred to the academic degree program, to fill panel A and vice versa (i.e., from panel B to D). In other words, a collection of courses followed at one degree program counts towards the graduation requirements at the other degree program. This is where the work group identified their second task: They must find 60 ECs of courses (within panel B and C) which can take the place of the earlier omitted courses (i.e., panel A and D). To summarize, the composition of the Dual Degree program is produced through two tasks. First, the work group curates a collection of courses which can be omitted (task i) and then they construct a collection which can take its place (task ii). A Dual Degree curriculum, ultimately, thus always transposes into a 'regular' artistic and academic degree program.

The previous explanation resembles the stories told by members of the work group at open days. I must confess that it was a bit puzzling at first. But the visualization, accompanied by a step-by-step explanation, helped me grasp the composition of the program. It is an explanation tailored towards aiding an uninitiated audience grasp the design of the Dual Degree program. It is not the only story, however. When I followed the practices[7] of the work group, I found something different, for nothing is 'transferred' from one degree program to another. Rather a *translation* is occurring here: it concerns the "creation of a new link that did not exist before" (Latour 1994, p. 32). The original course, after all, remains untouched and continues

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[7] The only viable slogan of ANT, as Latour (2005, p. 227) once said, is to 'follow the actors' which is meant to direct the inquirer's attention towards their "practices" (see also, Mol 2010, p. 260), rather than primarily relying on ideas or asking human actors to provide meaning for their actions.

to fulfill its function (that is why a course counts towards the graduation requirements of the artistic *and* the academic degree program). The novelty lies in the link produced by the work group. This modest point already suggests something to which I will return in the discussion: art-science is not a newly established relationship between two formerly unrelated entities (for this point see also, Van Baalen 2023), rather art-science is always a positive intervention. It adds something that was not there before. Or, in this case, it is an *attempt* to add something, because at the art-science construction site things "*could still fail*" (Latour 2005, p. 89, emphasis in original).

Although tracing the practical engagements produced an alternative account from the explanation presented at the beginning of this section, it does not necessarily mean that the initial explanation is *false*. The initial explanation simply seeks to address different concerns. It is helpful in succinctly explaining the nature of the Dual Degree program to a group of prospective students, to interested colleagues, or to nosy researchers. But the same story does not suffice to respond to the concerns raised by examination committees or those tasked with documenting the students' progress in the grading management software. Those concerns require a different path of action.[8] In the next section, it is my objective to shed light on the practicalities and materialities of the translation process.

Translating the universal into the particular

The members of the work group keep tabs on 'their' Dual Degree students. Meaning that they compare Excel-based curricula with a student's registered progress in the grading management software. In this exercise, the oftentimes lively and erratic nature of the educational experience to which the grades refer is obscured by the apparent precision and unambiguous nature of the final grade. As digital data, the grade becomes *information* which can be processed, stored, compared, shared, and retrieved (Tsoukas 1997, pp. 829–830) and, I may add, empirically traced by ANT researchers. This is an essential conversion: the grade transcends the local and historical specificities of the course and has the capacity to "to remain uniform across separate and diverse local settings" which is key to the functioning of large-scale organizations (Smith 1990, p. 126). In this capacity, grades afford organizational actionability.

To the work group the grade is mainly understood as the indicator of (un)successful participation in a course. The grade informs whether a student has, or has not, obtained the ECs. The European Credit then is an even more powerful abstraction than the grade, moving away further from the learning to which it refers. The grade, so it seems, is still too messy. It comes in different manifestations (e.g., letters, percentages, numbers) and has different functions, at different times, to different actors. As a "*cascade* of ever simplified inscriptions" (Latour 1986, p. 16,

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[8] As Mol (2002, p. 109) argues, with the help of Latour (1988, p. 179), different paths carry different kinds of traffic and help us move to different destinations. It is not helpful to classify them as false or illogical, it is more productive to ask: where do they get us?

emphasis in original), the European Credit rids itself of such noise and contingencies and appears as the 'currency' in which the degree programs are reshuffled. In my research context, ECs should be understood as the 'universal equivalent' of the European educational landscape: it is the quantitative measure that allows for comparison and exchange of qualitatively different learning activities.

The website of the European Commission (n.d., para 2) states that the European Credit Transfer and Accumulation System (ECTS) "allows credits taken at one higher education institution to be counted towards the qualification studied for at another". Within the Dual Degree program, ECs are thus used in direct accordance with their telos. Still, however, problems arise. It is precisely the universal equivalence that sits uneasy within the RASL consortium. If, after all, their curricula are interchangeable then what makes, for example, the artistic degree program distinctive? What makes it an artistic and not an academic degree program? These are concerns that surface in the 'RASL room' where representations of art curricula lie inches apart from their academic counterparts. Insisting on being "as myopic as possible" (Latour 2005, p. 105) brings into view the many flat inscriptions that are mobilized, compared, transformed, and displaced in order to stabilize the new art-science intersection. The bureau of the work group is much too full to have place for 'ruptures épistémologiques' (Bachelard 1967) nor does there exist a "gulf of incomprehension" (Snow 2012/1964, p. liii) between the arts and sciences. The many inscriptions appear next to each other and are creatively shuffled to make possible different "organizational courses of action" (Smith 1984, p. 66).

But let me return to their concern instead of reflecting on it: If the different curricula are interchangeable, then what makes the artistic degree program distinctive? What makes it an artistic and not an academic degree program. Here, it becomes clear that the universality of the ECs manifests as a threat against the identity of the degree program. The demarcations of the programs, which can usually be taken for granted, are put up for debate by the practices of the work group. Even with a fourth of the ECs obtained at a different institution (and for the academic degree this amounts to a third), the artistic degree must indeed be presented *as an artistic degree*. It is thus up to the work group to demonstrate that the incoming ECs, those universal equivalences of the educational system, are in fact context-specific and selected for their *particular* qualities. Conceptually, this is an interesting translation, because it does not depart from "inequivalence between interests or language games and that the aim of the translation is to render two propositions equivalent" (Latour 1988, p. 253), rather it starts from equivalence moving to inequivalence. There is no preexisting inequivalence, as 'art-science' may lead one to suspect. The work group, dealing with a cascade of ever simplified inscriptions (as mentioned earlier), is engaged in actively producing the inequivalence that is commonsensically associated with art-science.

Making the translations auditable

In the curriculum-building process, the work group identified two tasks for themselves. The first task is to curate a collection of courses that can be omitted from

each degree program. The second task is to find courses, in the other program, that can take up the space of the earlier omitted courses. The first step happens in an intuitive process of gauging and reasoning. Initial proposals are informally discussed with colleagues (of the Student Affairs Office, the Scheduling Office, and those affiliated with examination committees, etc.) before doing the paperwork. The already existing representations of the different curricula serve as an important heuristic tool in this process. Figure 2, for example, shows my recreation of how the academic degree program presents its own curriculum at their website. The actuality and historicity of being in a classroom (or on Zoom, for that matter), of studying together, is organized into neat blocks. One block constitutes a course, three blocks a term, twelve blocks a year, and 180 ECs result into a curriculum. The art school's curriculum is presented on their website in a similar format (i.e., much alike Fig. 2). This is the arena, where "relations are mediated by objectified extra-local forms", in which the opportunities arise, for the work group, to construct something like a RASL Dual Degree curriculum (Smith 1990, p. 126). The two-dimensional, formalized curricula *permit* (see Latour 2005, p. 72) the work group to reshuffle the blocks into a new composition. It is the similarity across institutions, in shaping and representing their curricula, that enables one to envision the coming-together of difference. This is worth pointing out, because in accounts of art-science there is oftentimes a disproportionate attention for difference. The number of publications (both in popular outlets, websites, and in academic journals) that discuss art-science collaborations by using the metaphor "bridging the gap" is enormous. The gap-bridging lingo, with its emphasis on difference, easily obscures how sameness also feeds into the conception and stabilization of new art-science initiatives.

If, however, after sufficient back and forth, a satisfying collection of omittable courses is created, the work group moves on to their second task. For the purpose of clarity, I have decided to report on these tasks sequentially, but in practice they very much fold into one another. Once the 'omittable courses' are selected, courses at the other institution have to be selected to repair the incomplete curriculum. But how does the work group come to a decision as to what courses to select? For an academic, this question may prompt discussions about the essential differences between art and academic education. In a front-line educational journal, it may make sense to set up such an opposition and to pick it apart, but the RASL room is not the locale to do so. For the work group, this is a practical question that needs to be addressed, but not 'solved out of existence'. Partially, the way to deal with this question is structured by concerns that are not necessarily their own. That is to say, the way to address this question is informed by (for example) the stake the Student Affairs Office has in this question (e.g., binding study advice requirements), or the Scheduling Offices (e.g., are there enough rooms available?), or the Student Counsellor (e.g., is the 'studyability' assured?), or the Examination Board (e.g., are all the graduation requirements met?). The concerns of all these different parties already paint the parameters of which courses to select. The remaining space to maneuver is intuitively navigated (informed by experience and intimate knowledge of the different institutions) by the work group. A member might, for example, say: "We omit research courses within the artistic degree, because they (i.e., Dual Degree students) can easily obtain these skills within the academic degree program". For the myopic

Sample curriculum

Academic core (45 ECs), Major courses (75 ECs), Electives (60 ECs)

	Term 1	Term 2	Term 3	Term 4
Year 1 (60 ECs)	Academic core	Academic core	Academic core	Academic core
	Academic core	Academic core	Academic core	Academic core
	Academic core	Elective	Elective	Elective
Year 2 (60 ECs)	Major course	Major course	Major course	Major course
	Major course	Major course	Major course	Major course
	Elective	Elective	Elective	Elective
Year 3 (60 ECs)	Exchange period (optional)		Thesis	
			Major course	Major course
			Elective	Elective

Fig. 2 Recreation of how the academic degree program represents its own curriculum

researcher, the aforementioned concerns always appear "at once generalized *and* specific" (to use Suchman's words, 2000, p. 316), in the form of an urgent email from the Dean, a colleague waving a renewed assessment policy, or a recurring agenda point during a work group meeting addressing 'accountability'. But there is more that gives shape to the practice of selecting courses.

As mentioned in the introduction, the prospect of the looming audit is never far away at one of the institutions. The decision to omit certain courses and bring in others must stand the scrutiny of the audit. The curriculum-building process must be made auditable. That is, "structured to conform to the need to be monitored ex-post" (Power 1994, p. 8). Therefore, the learning objectives of the selected courses (arguably already a result of the emphasis on creating auditable 'paper trails') are put in relation to the intended learning outcomes of the degree program to which the course will *also* contribute.[9] The cumulation of all learning objectives, of the courses selected as part of task two, must sufficiently cover the intended learning outcomes of the degree program. In a comprehensive Excel-sheet the intended learning outcomes of all individual courses, brought in to repair the incomplete curriculum, are thus 'matched' with the intended learning outcomes of the receiving *degree program*. To put it differently, the boundaries of the degree program that were momentarily contested through the practices of the work group are stabilized once

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[9] It is worth remembering that what makes a course unique *on the desk of the work group* (i.e., within the arena of extra-local objectified forms) are its intended learning outcomes and what makes a degree program unique—to put it bluntly—are its graduation requirements. These are the 'flat inscriptions' the work group is working with.

more. For all the Dual Degree curricula (because there are multiple combinations possible), this amounts to an enormous database of meticulously prepared (digital) paperwork. If the learning objectives for a selected course change, or the intended learning objectives of the degree program change, then all documents demand revision. This, then, is the labor required within the RASL consortium, to put to use the European Credit Transfer and Accumulation System in direct accordance with its purpose. It is also the labor required to demonstrate that an artistic degree remains and artistic degree after the 'exchange' has taken place. Interestingly, and to this point I will return in my discussion, in the gesture of repairing the degree programs and thereby satisfying the 'policing' eye of the anticipated audit (see e.g., Power 1994, p. 6), something has *also* been created.

Transcending boundaries by (de)constructing them

The previous section opened with a visualization of the Dual Degree program (Fig. 1). Revisiting this figure now, it should become clear that much of the efforts of the work group are concerned with *the rearticulation of boundaries in order to transcend those boundaries*. In the visualization, the academic degree program is demarcated by a red line. It *is* the academic program by virtue of that red line. Within the construction of the Dual Degree curriculum, the particularity of the program is threatened by the influx of 'foreign' ECs. The ECs, commonly functioning as silent and frictionless intermediaries, turn into "full-blown mediators" in the motion towards an art-science intersection (Latour 2005, p. 81). Here, the members of the work group seem to act in the spirit of ANT. They understand that it is heterogeneities all the way down (Latour 2005, p. 5). They unpack the ECs, with the conviction that *anything could be different*, and reassemble its ingredients into a composition that enables their preferred path of action.

But to understand why the threat appears *as a threat* in the first place, it is important to pay attention to the demands of the audit. During the verdict, after all, the academic degree program (to stick with my earlier example) must be able to present itself as a coherent, rational entity. The institution must live up to that cluster of values that the audit *as an idea* carries along, such as: efficiency, rationality, visibility, independent validation, and control (Power 1994, p. 13). If they fail to do so, in an educational landscape where there is an ever-growing emphasis on output, performance, and value for money and where universities operate in quasi-markets for institutional funding (Enders and Westerheijden 2014, p. 190), the consequences can be dire.

The auditors, however, will not dive into the enormous database put together by the work group (although the sheer quantity of the stored files may be a persuasive force in itself, adding to the legitimacy of the undertaking). Rather, the auditors concern themselves with the "control of control" (Power 1994, p. 15). They look for documents and 'proof' to see if the control mechanisms are in place. The daily, monotonous, but also creative work of making the art-science initiative 'audit proof' is to be understood, here, as a process of purification. External elements must be

translated into the logic of the institute. These processes then produce and perform the institution as a coherent, rational, and pure entity.

The RASL consortium has an important stake in engaging in these processes of purification. They must protect the legitimacy of the respective institutions and degree programs because they mobilize it as a resource to build their art-science consortium. It explains why the work group goes to great lengths to restore the artistic degree program as *an artistic degree program*. The Dual Degree curriculum, for the gaze of the anticipated audit, vanishes. In the realm of intended learning outcomes and paper trails, the Dual Degree does not exist as such. It is always just another artistic and just another academic degree program. The paradox is that exactly this vanishing act is necessary to help it exist. Latour (2005, p. 37) argued that "the object of a performative definition vanishes when it is no longer performed". In line with that statement, but appearing as an inversed analogy, I would argue that art-science remains because it continues to perform a vanishing act.

At the art-science construction site, the practices of the work group dispute and put at risk certain institutional and disciplinary boundaries. Amidst this uncertainty, they have found an unlikely but welcome ally: the second-order control structures so pervasive in higher education (Power 1994, p. 40). The chastised 'auditable paper trails' (Shore and Wright 2000, p. 73), that populated and circulated through the RASL room, were precisely mobilized as a point to which the work group tried to anchor their precarious intersection. In so doing, the work group finds itself in the business of both disputing *and* rearticulating boundaries, which is by no means an exposé of the insincerity of the endeavor. On the contrary, the ability to effectively alternate between both strategies is exactly what enables them to realize the hyphen between the arts and sciences, it enables them to stabilize the new intersection.

Discussion

The paradoxical way of holding the RASL consortium together speaks to the imagination. Especially so in a time where the calls for 'more collaboration and more outreach' resound in a variety of sectors. I would like to consider the *modus operandi* of the work group as a "mode of syncretism" of continuous repair (to add to the list created by Law et al. 2014, pp. 177–186). The mode of continuous repair points to the tendency not to avoid 'threats' but to continuously attend to them and fix them. In so doing, the initial motivation for coming together is never dissolved. To put this in the terms of my case study is to say that the RASL consortium never culminates into a metadiscipline but rather protects their reasons for coming together. They are hyphened but not homogenous. They keep the friction, the "creative qualities of interconnection across difference", to speak with Tsing (2005, p. 4), alive.

The work group, of course, does not choose a 'mode of syncretism' from a profusely filled toolkit. In my case study, it emerged from the work deemed necessary to keep the consortium afloat, to keep the new intersection stable. If the work group, among other actors, fail in their efforts "things start to lose their shape, lose their characteristics and seep away" (Law and Singleton 2005, p. 337). As discussed before, many of these efforts are informed by the "pervasive logic" of the

audit (Power 1994, p. 3). The consortium turns its practices into a host of "auditable structures" and paper trails that can stand the scrutiny of the visiting auditors (Shore and Wright 2000, p. 72) because, in a way, they *have to*. Because, as Shore and Wright (1999, p. 570) also note, it is "very difficult to remain unaffected" from the self-referential and self-reinforcing system of audit technologies. But the work group does not try to remain unaffected.

The translations of the work group are geared at assuring that in the 'gaze of the audit' both the artistic and the academic degree program are complete, coherent, and distinct from each other. As such, the Dual Degree program exists in the audit's blind spot. This is the case because audits are concerned with quantification and a morality of attainment in which aims and ambitions are turned into targets, outputs, and indicators (for a more elaborate discussion see: Strathern 1997; Shore and Wright 2015). The larger ambitions are approached as if they can be taken apart and reassembled again, to put it bluntly. But as Strathern (1997, p. 313) points out (and "any student of gender relations knows", she adds): "Elements taken alone may have a rationality that becomes something else when they are put into a wider context". Although no students of gender relations, the work group knows this as well and they use it to their advantage. They satisfy the atomized rationality of the audit, knowing full well that in the 'wider context' it helps into being an art-science consortium.

All the ingenious translations and efforts of the work group are oftentimes considered superfluous to the "real work" (Shore and Wright 2000, p. 72; Strathern 2000, p. 290). Yet, I would argue that this 'unreal work' is, to a significant degree, precisely the stuff *art-science* is made of. It is the work required to be *innovative* and to answer to national aspirations of 'more outreach' and transdisciplinary aspirations to 'reunite the arts and sciences; it is the work required to hyphen the arts to science. This 'unreal work' (which as a material practice is of course all too real) became especially apparent in an encounter where different institutional realities, with different dependencies on and histories with audits and 'quality assurance', are put in relation to each other. But it is no less prevalent and demanding in situations where institutional and disciplinary boundaries are not (or to a lesser extent) transgressed. Perhaps, however, they do a better job of hiding in plain sight, so firmly enmeshed in the everyday rhythms of academic life. Nonetheless, our (digital and physical) desktops are scattered with assessment matrices, grading sheets, and more recently (and quite worryingly) Proctor policies. They are distinctly visible but tend to remain outside of our accounts of art-science, which is not helpful if we wish to move towards more sustainable ways of 'doing art-science'.

Conclusion

In this study, equipped with an ANT "repertoire" (Mol 2010, p. 261), I approached the encounter between the arts and sciences from the art-science construction site, "not through the more grandiose entrance of ready made [art-]science" (Latour 1987, p. 4). This shift in register allowed me to tell a different story. In contrast to more "unitary, epochal" accounts of changes in our modes of knowledge production

(to borrow Born and Barry's terminology 2010, p. 104), I tried to present a story "where the cost of travel from one connection to the next [has] been fully paid" (Latour 2005, p. 25). In so doing, it became impossible to ignore the practices of the "gratte papiers" so fundamental to realizing the hyphen between the arts and sciences (Latour 1986, p. 26). The efforts of the work group are intimately intertwined (in perhaps both a subversive and deeply loyal manner) with the structuring presence of the looming audit. Their mundane, bureaucratic practices are a source of an essential power. They are key to the sustainable reproduction of new intersections in the current European educational landscape. Being attentive to those practices in scholarly conversations on art-science, helps to *think through encounters across difference* more astutely. In an ambitious 'emerging field', that does not shrink away from addressing 'wicked problems' and the 'tensions menacing life on our planet', I would urge all those who affiliate with the field to extend their ambition and boldness to scrutinizing 'our own'[10] orderings of art-science.

Data availability The data generated and/or analyzed during the current study are not publicly available due to their containing information that could compromise the privacy of the institutions concerned and the research informants. Relevant portions of the data can be made accessible, assuring a discrete format, upon reasonable request from the corresponding author.

Declarations

Conflict of interest The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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[10] I use the phrase "our own" to emphasize that academics are implied in audit practices and have agency (to differing degrees) to choose differently. Also, auditors are not aliens—as Strathern (1997, p. 319) has reminded us—they are a version of ourselves.

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