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SYMPOSIUM

Reflective writing for enhancing knowledge integration in modularised study programmes

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Abstract A more flexible approach to structuring study programmes across European universities enables students to choose which courses to take, in which combination and order. This flexibility is a step towards fuller self-reliance for students as learners. However, it can also reduce the coherence of studies and fragment the learning experience into units (courses or modules). To prevent the fragmentation and encapsulation of knowledge, we devised a reflective writing exercise we called 'Building Bridges'. It requires students to detect and present connections between courses in their study programme, relevant to their personal learning progress. We carried out the exercise in three courses in a highly flexible modular undergraduate study programme at the University of Freiburg, Germany. In 54 submitted assignments, students on average identified 3.6 relevant connections per assignment of 700 words. Based on the responses, we identified six types of logical connections between courses: similarity, difference, development, challenge, application and contextualisation. Grading the assignment does not seem to influence the reflection. We conclude that, even with minimal guidance, students are able to build multiple connections between courses. Yet, students found it challenging to present connections between courses in the framework of their individual learning pathway, personal academic interests and goals. These tasks require more training and support.

Keywords Assessment · Cumulative learning · Knowledge transfer · Learning outcomes · Modularisation · Reflective writing

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Introduction

Many study programmes in social and political sciences today are modularised and provide students with a variety of choices as to which courses to take and when and where to complete them. In Europe, this is mainly an outcome of the Bologna Process, which included modularisation and the separation of university studies in two cycles: Bachelor and Master. The aims of the Bologna Process are to harmonise study programmes and diplomas in wider Europe and to promote mobility and exchange. Ultimately, these developments should boost the competitiveness of the European education system and increase employability across the region, especially among the young (Ministerial Conference 1999; European Commission 2012; Eurostat 2016). The rationale of the reform was therefore more socio-economic than didactic (Bülow-Schramm 2013: 13).

The socio-economic foundation of modularised studies hinges on the concept of a learning-based economy. It requires individuals to build knowledge and skills in a continuous, cumulative way: that is, to be lifelong self-regulated learners (Boud and Falchikov 2006; Economist 2017). Yet, previous experiences with modularisation and research on its effects suggest that modularisation may lead to such unwanted outcomes as fragmentation and the encapsulation of knowledge in modular units (Bell and Wade 1993: 6–8). Thus, there is a clear tension between the goals (lifelong cumulative learning) and consequences of modularised studies (patchy, disconnected knowledge).

In this paper, we introduce one way to counter fragmentation of knowledge: encouraging student reflection on personally relevant connections between courses. Research on reflection in learning, teaching and assessment suggests that instructors can support cumulative learning by developing learners' skills in reflection. As we teach in a highly flexible modular Bachelor study programme at the University of Freiburg, our students take a variety of different courses before and after they enter our classrooms. We wondered if reflection could be used effectively as a way to help them to build bridges between these units and to achieve better integration of their studies.

To encourage reflection, we designed a written assignment that we called 'Building Bridges' and carried it out in three courses. The purpose of the exercise was to provide the students with an opportunity to reflect upon their studies in a structured manner.

We commence with a brief review of the literature on the drawbacks of modularisation and present reflection as a process contributing to cumulative learning and thus mitigating the downsides of modularised studies. We then present our exercise and explain how we carried it out. The results section describes the quantity and kind of student reflection. Finally, we discuss the design and future use of such exercises.

State of the art: cumulative learning and reflection

Cumulative learning, in contrast to the mechanistic accumulation of knowledge, relies heavily on reflection. Active reflection can help learners to rethink, adapt and apply acquired knowledge to new situations in the future (Schön 1995). Reflection

is essentially the interpretation and reinterpretation of the learning experience, followed by integration of produced meaning into 'personal mental models of learning and studying' (van den Boom et al. 2007: 534; Rogers 2001). This cognitively demanding task raises the student's awareness of learning, its components and its results, and of the student's role in it. Cumulative learning, seen as '[the] capacity to continually build knowledge, add new skills, and give new meaning to existing abilities' (Maton 2009: 43) hinges upon knowledge transfer from one context to another and on challenging previous knowledge and upgrading it. Learning about Marx and Marxism in a political theory course does not automatically create the ability to understand elements of the worldview and ideology underlying, say, critical discourse analysis. Still, such ability—if relevant for the student—can be cultivated.

While the transfer of knowledge is difficult in itself (Grossman 2009) and requires high-order cognitive meta-competences (Bridges 1993: 50–51), an important challenge to cumulative learning in universities is the segmentation of the learning experience, characteristic of module-based degrees, where knowledge is presented in the very specific context of the module (Bell and Wade 1993: 5). Early adopters of modularised study programmes, such as the United Kingdom, experienced this challenge as central to the debate around reform in the 1960s and 1970s (Bell and Wade 1993). Recent research confirms that fragmentation of learning experience and departmentalisation of knowledge and skills are the likely downsides of Bologna. Thus, Hughes et al. (2015: 1090) note that 'there is a form of closure particularly arising from modularisation' as it is not clear how students are supposed to use assessment and feedback in courses to build towards longer-term learning success.

A way to mitigate this downside of modularisation is to exploit the student ownership of the learning process, enabled by increased flexibility and choice. Student initiative could substitute for the positive effect that the traditional systematic hierarchical structure had on the integration of studies. This initiative would need to receive support from instructors, since a supportive didactic structure for cumulative learning is not inherent in the Bologna Process. Promoting self-reliant reflection on ways to synthesise learning outcomes from different modules can help undergraduate students experience their studies in a coherent manner.

Reflection can be used not only to enhance learning in a particular course or module but also to achieve positive results at the level of the study programme, for example, by encouraging students 'to view learning as a process, develop students' metacognitive awareness, and promote transfer of learning' beyond individual modules (Allan and Driscoll 2014: 38). Alone or in combination with a discussion, regular reflection and reflective writing have been found to 'enhance self-awareness and encourage student self-care in the face of … emotional strain' (McLeod et al. 2015: 450).

Research shows that the complex reflective skills which underpin individual reflection can be taught through a structured academic approach of development and practice (Bain et al. 2002). Providing structured opportunities for reflection ('scaffolding') is key, since it appears that students do not tend to engage in reflection on learning on their own (van Velzen 2002 cited in van den Boom et al. 2007: 534). If the supportive structure is successful, students can develop the skills and habits

needed for self-reliant planning of the learning process and transfer of knowledge, and can accumulate knowledge in a critical and integrative manner rather than mechanically aggregate it (Maton 2009: 44). More exactly, cumulative learning takes place when learners can 'detach' knowledge from the context in which it was acquired. This process requires the learner to 'leap up' from the text or experience 'to reach more abstract principles with which different texts can be related together', to be relocated to a different context (Maton 2009: 54). Maton uses the metaphor of gravity to describe this distancing from the immediate content ('weakening semantic gravity') and re-anchoring into a new context ('strengthening semantic gravity') (Maton 2009: 54).

The intention and design of our reflective exercise originate in Schön's concept of reflective transfer (Schön 1995) and Maton's concept of cumulative learning (Maton 2009); it is also influenced by Perkins and Salomon's detect–elect–connect model (Perkins and Salomon 2012). This model emphasises the stages of description, evaluation and adaptation in the process of writing. As Allan and Driscoll note, students 'have to develop meta-awareness about where prior knowledge may apply, elect to pursue connection, and finally, connect and adapt that knowledge to a new circumstance' (Allan and Driscoll 2014: 39). Thus, they can select a particular concept, theory or topic covered in the current course and consider it in a new context, for example, by referring to a previous course in which they discussed the same issue from a different disciplinary, temporal or thematic perspective. Likewise, students may choose to 'borrow' a concept or idea from another course and bring it into the context of the current course. Such travel of ideas can be described in Maton's terms as an effort to distantiate an idea from a particular context of acquisition and introduce it into a new context, via reinterpretation. As a result of this transfer, ideas are interconnected, used in new ways and receive new meanings.

As guidance for kinds of reflective transfer that students can achieve, we use as the departure point the 4R model for teaching and assessing reflective learning by Ryan and Ryan (2013), which builds on Bain's reflective scale model (Bain et al. 2002). For our exercise, we expect students to engage in reflection on the two higher levels of the 4Rs scale, which go beyond the 'rudimentary reflective thinking' (Ryan and Ryan 2013: 9) and are seen as indices of more sophisticated thinking: reasoning, and reconstructing and reframing (Table 1).

Table 1 Summary of the 4R model

Reporting and responding	Description, reporting, summary of learning and, optionally, its relevance
Relating	Building connections between the learner's skills, ideas, experience, or disciplinary knowledge and the issue at hand
Reasoning	Relating, enhanced by emphasis and selectivity, illustration and exemplification, and discussion of alternative or new perspectives
Reconstructing and reframing	Reframing knowledge in a new context Achieving an understanding of the underlying principle of the connection Formulating meta-conclusions about inter-contextual knowledge and its transfer

Based on Bain et al. (2002) and Ryan and Ryan (2013)

Reflective exercise 'Building Bridges'

Our exercise consists of two questions, which the students answer individually as a part of the course requirements. The first question focuses on connections between courses, which are relevant in the context of the student's personal study path. With this question, we wished to provide students with an opportunity and motivation to look at their studies as a personal project and take steps to integrate their previously fragmented and context-related knowledge, guided by general criteria (see the "Appendix"). To explain what the connections between courses can be about and help the students structure their reflection, we give examples of grounds for possible connections: topics, theories, concepts, authors and methods. We also advise students on how to find these connections. The second question focuses on intellectual challenges arising from interactions between courses in terms of content or method. We suggest that a challenge can mean a questioning of a 'previous belief, understanding, or opinion'. The purpose of this question is to encourage reflection leading the students to identify and analyse the intellectual challenge posed by knowledge and beliefs acquired in fragmented elements of students' studies. We worded the task to be sufficient without further explanation from the instructor and tried to strike the right balance between clarity of expectations and openness to valid individual interpretations. We do not use or intend the assignment as feedback on teaching.

In comparison with other reflective writing assignments, 'Building Bridges' is innovative on two levels. On a micro-level, 'Building Bridges' supports reflective transfer across academic and social contexts (Schön 1995) with a task of a wide scope: we leave it up to the students which courses to connect and how, instead of asking them to reflect on a single course or on a specific type of courses, for example, writing courses. On a macro-level, in comparison with previous scholarship on knowledge transfer between social spheres (academia-to-practice; practice-to-academia; or practice-to-practice, see Bain et al. 2002; Maton 2009; Ryan and Ryan 2013; McLeod et al. 2015), we focus on achieving cumulative learning at the academic level. We motivate students to integrate their learning experience in individual modules of their study programme and thus promote a cross-modular, programme-level reflection. We hope that by completing such exercises regularly, students will develop self-perceptions as stakeholders, active agents in the academic learning process.

Cases

We assigned the reflective writing exercise to students in three courses in the academic year 2016–2017. All three courses are part of the Major Governance (Social and Political Sciences) in the 4-year Liberal Arts and Sciences undergraduate programme at the University of Freiburg, Germany.

The structure and content of the Governance Major is strongly interdisciplinary and, therefore, potentially fragmented. Students take courses for 13 modules, such as political philosophy or political theory, politics, economics, law, international and

regional governance and so on. As curriculum designers, we strive to create some connections between modules by introducing the same topics, authors and theories in different consecutive courses. Ultimately, however, it is key that students connect knowledge from a variety of socio-political disciplines themselves, since they are free to select courses for each module.

Two of the courses are introductory courses in Political Theory, very similar in content and taught by the same instructor during one semester (with 15 and 21 participants, respectively). Students in these courses are mainly in their second-year of studies, and take the course to complete a mandatory module in the Major. The third course is a course in International Law for senior undergraduate students, also in the Governance Major, but not mandatory for the students (with 18 participants). In all three courses, we introduced the assignment as a mandatory part of the course assessment in the middle of the course. The guideline size for the answer was 500–750 words. Students had 7–9 days to complete the assignment and submit it via the online learning platform of the university.

The use of reflective exercises has been connected with ethical hazard, as pointed out in Hickson (2011). Reflection, especially since it is individual in nature, may expose students, 'reveal their weaknesses in a way that [is] destructive, harmful and unprofessional' if used without sensitivity (Hickson 2011: 832). To mitigate the ethical hazard, assignments were submitted anonymously (students signed their work with enrolment numbers, which is standard practice in these courses). Even at later stages in the course, authors of individual assignments were not known to the instructors, as a teaching assistant put together the assessment and the names for the purpose of course requirements check.

The exercise was assessed according to a common grading scheme, jointly developed by the authors. Thus, we kept the setup similar across the three courses. One major difference was that the assignments in the Political Theory courses were graded (7.5% of the course grade), whereas in the course on International Law, the assignment was evaluated as pass/fail. We introduced grading because it better fitted the course requirements in the Political Theory courses, and because we wanted to see if grading influences the reflection. Indeed, Allan and Driscoll (2014: 48) suggest that grading reflective exercises makes students take them more seriously. For this study, grades as such are not important, so we will not discuss grades and grade distributions here. Still, we can note that all of the students who submitted the reflective comment for a grade achieved a positive grade and only one student in the pass/fail case failed at the first attempt. (The student was asked to revise and resubmit the assignment; the failed assignment is not part of our data.)

Types of connections and coding procedure

In three courses, students submitted 54 reflective comments on connections between courses and intellectual challenges posed by such connections. We proceeded to categorise types of connections based on previous research (namely, Ryan and Ryan 2013; Maton 2009) and on an inductive search for patterns. We read the assignments and took note of analytically distinct logical linkages underlying the connections

students established between courses, such as *similarity*, *difference*, or *challenge*. We decided to group connections by logical rather than thematic linkage (a classification by thematic linkage would be organized by author, topic, theory or method). We also agreed that some connections appeared to be more complex than others. While some students simply mentioned similarities in topics or authors covered, others reflected on ways knowledge acquired in previous courses gained new meaning for them in a subsequent course.

In a cyclical process of applying and refining our categories (types of connections), we arrived at a typology of six analytically distinct types of connections: *similarity*, *difference*, *development*, *challenge*, *application* and *contextualisation* (see "Appendix" for definitions and examples). We then coded all assignments using this classification. Two research assistants pre-coded all submissions; then the authors double-checked and refined the results. We discussed problematic cases until we reached agreement on coding.

We used the following definition of a case (coding unit): a connection between two or more courses, including the current course, of one type (from the possible six) on one ground (topic, theory, author, or method). This definition excluded certain types of reflection from coding: connections between the current course and the life experiences of the student; reflections on the current course and learning within it; reflections on another course without direct connection to the current course; and reflections of a very general nature or vague statements. We subdivided complex reflections: we coded different types of connection with the same ground, or different grounds with the same type of connection, as separate cases. We relied on explicitness for coding the connections. We did not code cases where the student implicitly connected two courses but did not explicitly present the connection, or where the formulation was vague and unspecific. Typically, the student hinted at a connection between courses or claimed it existed but failed to demonstrate it.

In addition to these six categories, we separately coded instances of conceptual change resulting from students making a connection. Since change always happened based on a connection, connection types and change are not mutually exclusive categories: we coded *change* in addition to one of the six categories presented above, that is, for each connection, *change* was coded as either present or absent. *Change* and any other category, including *challenge*, are not mutually exclusive. Some students formulated general comments and conclusions on the exercise itself and its use; we recorded these separately. We found these 'meta-conclusions' useful in seeing how students perceived the exercise and how they contextualised the reflection for themselves; we therefore present some of them in this paper.

Results: the bridges students built

We coded 192 cases (connections) in the 54 submitted assignments. In addition, we recorded 16 'meta-conclusions'. On average, students established 3.6 connections per assignment (SD 1.5), with little variation across the three courses (Table 2). The fact that the assignment was not graded in the International

Table 2 Number of connections, by course

	Mean	SD	Number of cases	Number of students
International Law	3.6	1.7	64	18
Political Theory 1	3.5	1.5	53	15
Political Theory 2	3.6	1.5	75	21
Total	3.6	1.5	192	54

Law course did not have a substantial impact on the number of established connections.

Across all courses, about a fifth of students identified only one or two connections. It is possible that these students struggled with the assignment or did not put enough effort into it. Some students, however, clearly decided to focus on one or two particular connections they had found. In other words, the number of connections does not necessarily reflect the effort invested in the reflection and the level of sophistication. For example, one student in the International Law course identified only two connections but discussed these cases extensively. The following extract from the student's response illustrates a well-developed connection (case coded as *challenge*)[1]:

Example 1 In a class on Conflict Resolution […], we discussed the concepts of unconventional warfare and asymmetric conflicts in the aftermath of 9/11, both prevalent in the War on Terror. The Operation Enduring Freedom was the United States' response to the terrorist attacks in 2001 and addressed at the al-Qaeda network and like-minded Islamist terrorist organizations. Even though I was very critical about this war and its effectiveness and effects in the Middle East, I never really doubted the legitimacy of the intervention as such. Being aware of the Security Council Resolution 1368, which recognized the right to self-defence in the particular case, I did not acknowledge the fact that customary international law and treaty law actually limit the scope of the right to self-defence to the attack of another state. While I would not claim that the War on Terror was less legitimate because of this fact knowing that the Security Council expressed its support for the military intervention, it alludes to the difficulties of responding to these new forms of threat.

The vast majority of students in all courses identified 3 to 4 connections in their assignments, followed by the number of students who identified 5 or 6 connections. Only 9 students drew between 6 and 8 connections. The level of heterogeneity in courses (students from different years of study and a considerable proportion of exchange students) does not seem to influence the distribution of the number of established connections in an expected way. In fact, in one of the two Political Theory courses, which was the most homogenous group, half of all

[1] When we give examples from student work, we use students' original wording. We corrected basic grammar mistakes and typing errors.

connections came from the assignments of only 29% of students. The figure is 39% and 40% for the other two courses.

Overall, these findings indicate that, in general, our students did not experience problems with finding connections between the courses, even though they received minimal instructions and only in the form of the task description itself.

Distribution of connection types

Table 3 presents the distribution of connection types we have identified. It appears that the most commonly established type of connection (a third of all cases) was *development* and the second most commonly used type was *contextualisation* (17%). *Similarity* and *difference* together made up one-fourth of all connections.

Results were similar across the three courses. This finding supports the idea that, without special training, students are likely to identify some types of connections, such as *development*, more often than other types. Interestingly, this is the case for both comparatively simple (*difference*) and comparatively more complex (*application*) connections. We can indeed think of different types of connections as a spectrum going from more logically straightforward (*similarity* and *difference*) to more demanding (*challenge*, *application*, *contextualisation*). Connections that are more straightforward may indicate a higher degree of semantic gravity (Maton 2009) in the students' learning; more demanding connections may rely on a weaker semantic gravity. A note of caution is necessary here. Although some types of connections may be easier to establish, all connections result from a complex, multi-step analytical undertaking. Some cases of *similarity* are basic (identifying the same author in two courses) and some are extremely sophisticated, offer original insights into ways courses can be connected and consist of highly developed analysis and synthesis. Similarly, connections that can be more difficult to establish judged by the type of underlying principle—such as *contextualisation*—can be general, vague or based on superficial criteria. The example below (coded as *development*) illustrates this issue: in our opinion, the presented connection relies on a considerable intellectual effort invested in thinking about how six different courses (plus the current International Law course) contributed to the student's understanding of international society:

Example 2 The law approach to international affairs thus extends my view on how the international society works, a topic that was addressed in various ways in my previous courses. One issue that was treated in all courses was the relation between

Table 3 Distribution of connection types across the whole sample, in per cent ($n = 192$)

	Contextualisation	Application	Challenge	Development	Difference	Similarity
International Law	14.1	10.9	15.6	32.8	15.6	10.9
Political Theory 1	15.1	18.9	11.3	28.3	13.2	13.2
Political Theory 2	20.0	12.0	12.0	36.0	4.0	16.0
Total	16.7	13.5	13.0	32.8	10.4	13.5

individuals and bigger entities, such as societies, nations, states, or organizations. In the course 'Introduction to Social and Political Sciences', first insights were given into social contract theory, collective action, and political agenda setting. The political approach to the relation between individuals and states, especially the justification for statehood, was deepened in the courses 'Introduction to Political Philosophy' and 'International Politics', whereas the focus in the first of both lay on the relation between the individual and the state, and in the second course on the relation between states and other international actors, such as international organisations. In 'Introduction to Economics' we saw international relations through the lens of economics, learning about theories on what role an individual, an enterprise, or a state takes in the international free market system. We furthermore discussed theories on how individuals make decisions and evaluated the concept of the homo economicus. [The student continues by connecting two more courses on the same issue.]

Challenge and change in the students' responses

Our assignment required students to identify an instance in which the current course challenged knowledge or belief established in another course (Question 2). Not all students answered the second question of the assignment in the manner we expected. In 42 instances, students identified either a challenge to or a change in their opinion. Given the total number of assignments (54) and the mandatory nature of both questions, this is surprising. At the same time, several students did describe a challenge that originated in the current course or in their life experience and thus could not be coded in this study, since its origin was not in building bridges between different courses. It can be that these students did not understand the second question or found a challenge originating in life experience more interesting or personally relevant. We did not notice a difference in the likelihood of answering the question about challenge from course connections in courses where the assignment was graded and the course where it was a pass/fail exercise.

Of the 25 cases of *challenge*, 18 described a challenged posed by the current course, without explaining how it has been resolved. Overall, in 24 cases students explained how a connection between two courses led to a change in their understanding or belief. We found it important to identify the source of the change (Table 4) and coded *change* as a dummy variable (no change/change) in addition to connection types.

Some connections between courses were more likely to bring change. 28% of *challenge* cases and 22% of *contextualisation* cases led to change. For one, *challenge* is a type of connection by which the student highlights problematic aspects of a topic, case or theory. For example, in a course the student may realise that her previous or current understanding of an issue is limited, incomplete, incoherent or deficient in some other way. This situation can be resolved by finding a way to overcome the problem—that is, by a change—for instance, by switching from the theoretical to the legal view on an issue, considered less complex or more objective. Likewise, *contextualisation* is a reinterpretation of old material with knowledge gained in the current course. Such

Table 4 Number of connections with and without change

	Number of cases with change	Number of cases without change	Total number of cases
Development	8	55	63
Challenge	7	18	25
Contextualisation	7	25	32
Difference	2	18	20
Similarity	0	26	26
Application	0	26	26
Total	24	168	192

reappraisal can not only add a new perspective to the student's understanding but also lead to a change in knowledge or opinion: when confronted with fruitful applications of a theory to contemporary cases, for instance, the student may realise that an old theory is not obsolete but useful. A similar, albeit somewhat simpler, logic applies to the cases in which change is generated by *difference* and *development*.

A case from a Political Theory course illustrates how students present a change in their original opinion. The student discusses how a *challenge* generated by new information leads him/her to a *change* of opinion:

Example 3 In addition to providing me with knowledge that I can interconnect to other courses, this course has also helped me to challenge my previous opinions I held to be true. For instance, previous economic courses […] teach the widely accepted economic aim of profit maximization. In my previous opinion, favouring a minimal state precipitates most innovation and economic growth and, therefore, is in the interest of society. This theory can be also found in Nozick's libertarian philosophy and in texts by Ray Kurzweil, which we read for the course on life and technology. To me, it was justified when companies legally try to avoid taxes or when a society puts efficiency as its highest value. However, Rawls' concept of justice as well as the ones of Pope Leo XIII and Pope Pius XI made me consider a more holistic economy. When taking Rawls' concept of the original position into account, redistributive policies that benefit the least well-off are plausible. Moreover, the popes and Rawls also indirectly address the problem of negative externalities caused by the consumption of public goods, such as fish stocks. Therefore, the primary theory of profit maximization seems too short-term oriented to me and bears the potential of causing social unrest due to inequalities.

Discussion

The first run of the 'Building Bridges' exercise has left us hopeful as to the potential usefulness of reflection in overcoming the danger of knowledge fragmentation in free-choice module-based study programmes such as ours. Students have been

able to come up with meaningful and varied connections between courses, with high consistency across the three courses and minimal guidance from the instructor. Looking for patterns in the responses, we have moved beyond the classification suggested by Ryan and Ryan (2013): our six types of connections are all situated at the two 'higher' levels of reflection suggested by Ryan and Ryan—reasoning (relating enhanced by emphasis and selectivity and discussion of alternative or new perspectives) and reconstructing and reframing. We thus nuance these categories and give them shape using the empirical material of 54 assignments. At the same time, the hierarchical dimension of the 4R model is questioned by our results: while some types of connections are logically simpler than others, the intellectual effort, sophistication and usefulness of the 'simpler' connections is often high, also in comparison with more 'complex' connections, as demonstrated by Example 2. With this important reservation in mind, we can still link some types of connections between courses with good potential for cumulative learning (Maton 2009), hinging on decontextualisation and re-contextualisation. Thus, connections we labelled as *contextualisation*, *application* and *challenge* all rely on reflective transfer (Schön 1995) and different ways to deal with congruence or incongruence resulting therefrom.

For students, the exercise seemed to provide intellectual stimulation and some, unprompted, commented on the assignment itself. In these comments, a handful of students expressed positive attitudes towards the assignment and the opportunity of building bridges between courses. These students found reflection to be a valuable tool for getting an overview of their academic development. Some students also reported that they found it easy to find connections between different courses. Below is a typical positive response (from a Political Theory course), in which the student comments on both of these aspects:

Example 4 These three courses only include a small fraction of connections which can be drawn from the discussed topics. I have specifically chosen courses out of three different modules because I found it interesting how many commonalities after all exist. I believe it is important to interconnect different topic areas also collectively, since it helps us to see things from a broader perspective and to critically ponder on what really matters.

Students in all three courses made similar positive comments. Still, these spontaneous comments are not numerous enough to see what prompted them: for instance, was it the grading of the assignment that induced these positive responses? Interestingly, however, only two students in one course (the same Political Theory course) made negative comments about the assignment:

Example 5 However, I see a problem with this learning diary question as it imposes certain expectations on the answers. There seems to be a necessity to find the right link between different courses. Finding such links is not always possible or easy, especially if one has not taken many classes with similar topics, for example, if this course is taken as an elective.

Example 6 Finally, I would like to mention that I find it a bit critical to make the task to reflect on one's individual learning process part of the graded examination of this course. Even though the question is focused on academic content, I believe the learning experience of each student to be very personal and thus not up to the lecturer's assessment. Making the writing assessment obligatory, but pass–fail, would seem more suitable to me.

Even though these are individual cases, it is important to discuss them. It may be the case that more than these two students had a similar negative understanding of the assignment, but did not want to write about their critical concerns, as the assignment was graded. Our reading of these negative comments is that the students felt, on the one hand, unease with the teacher's expectations concerning the assignment and, on the other hand, did not feel comfortable sharing their personal reflection. As these negative comments were made only in one of the courses in which the assignment was graded, it is likely that the grading either induced or exaggerated these uncertainties and the feeling of vulnerability. In addition, some students also commented on the very same aspects after they had received their grade for the assignment. However, none of the negative—or positive—comments about this assignment appeared in the anonymous course evaluations (the response rate was 100%). These difficulties should be considered when designing reflective assignments.

Conclusion: Using reflection for a more integrated study experience

The main conclusion from our explorative study is that it is possible, even with limited instructions and time from the instructor, to encourage students to successfully draw connections between different courses they take during their studies. Based on our results, we are confident that reflective writing exercises can support reflective transfer and encourage students to reconsider and perceive their learning process as more coherent and better integrated. We cannot hope it to be the case of all students but the analytical richness and the high number of the connections presented by our students demonstrates the potential of self-reliant student effort to bridge the fragmentation of modularised study programmes and enhance cumulative learning.

Concerning the design and future use of reflective exercises, we recommend introducing reflective exercises as pass/fail assignments, and to consider grading them as an option if the initial response fails to meet the goals. In our study, grading did not have a substantial influence on the quantity or quality of the reflection (in contrast to results obtained by Allan and Driscoll 2014: 48). Possibly, the main benefits of reflection can be obtained without grading, thus significantly reducing the workload of the instructor.

In what concerns potential ethical hazard of reflective assignments (Hickson 2011), some of our students felt uneasy describing their personal learning, despite the anonymity of the assignment. They considered the task more sensitive than we had expected. We recommend careful framing and formulation of the task, evaluation and discussion in class. If the students are assured that there are no right or

wrong answers in such assignments, and that the instructors do not expect them to make any specific connections, this may reduce the uneasiness.

Our exercise was limited in two important ways. The scope of our reflective assignment is restricted, as it asked students to make connections between courses, and was only applied in three courses. To strengthen cumulative learning and support better integration of knowledge, it would be beneficial to require students to reflect upon their current course as part of their overall study programme. That is, instead of asking students to build bridges between different courses, it may be desirable to ask them to construct threads throughout the different courses and put more emphasis on contextualising learning within the thought-through and explicitly presented intellectual priorities of the student's individual learning pathway. Additionally, if reflection was a reoccurring theme in each of the undergraduate courses or modules, students could become more accustomed to reflection and, consequently, more confident and proficient in it. Scaffolding reflection throughout the curriculum rather than just introducing it in individual courses should bring better and more long-term results.

Appendix

Appendix 1: Questions on the written assignment 'Building Bridges'

Critically reflect on your individual learning process in this course and answer the following questions:

1. In the context of your studies, what are the most relevant connections between the current course and previous courses you have taken?
To answer this question, provide concrete examples of topics, theories, concepts or terms, authors, or employed methods. It may be useful to look at the syllabuses of other courses, reading lists, your reading files, and essays.
2. In which way is the current course challenging your knowledge, perspective or opinion on a topic previously discussed in other courses?
To answer this question, think about cases where you have come to question your previous belief, understanding, or opinion on a topic, method, theory, concept, or author.

Appendix 2: Types of connections between courses, established by students

Similarity Courses are connected because the same author, the same or similar topic, theory, or method were discussed in both courses. *Example*: 'In a course about language and culture, we talked about constructions of discrimination regarding race or gender, which is also connected to the equality and justice aspect [covered in the current course].'

Difference Courses are connected because they cover the same or similar author, topic, theory, or method but in a different way. *Example*: 'In this same course, we discussed Marxism and various components such as his historical materialism. However, the way we applied Marxist theory was by questioning its political and economic application to the global market.'

Development Courses are connected because knowledge gained in the current course is presented as developing or adding to the knowledge the student has gained in another course. *Example*: 'Obviously, the course Introduction to Social and Political Sciences is also heavily linked to political theory and was helpful for getting an initial insight to the field while so many theories, for instance considering Rawls I have only been able to fully grasp his ideas now with the material and discussion of this course.'

Challenge Courses are connected because knowledge gained in them creates or highlights an intellectual challenge for the student. *Example*: 'Besides from the connections I can draw to other courses and non-university activities, it also challenged my understanding of liberty and communism. I define myself as a social-liberal. For me, the conflicts between Mill, Rawls and Marx and Engels are the conflicts where I am not sure of my own position. […] Nevertheless, I did not know where to start my critique and was rather unsure about the legitimation of my own position. […] These conflicting interests are still unsolved because I see both sides' advantages and disadvantages […]'.

Application Courses are connected because knowledge from another course helped to better understand the current course or was used in the current course on the initiative of the student. *Example*: 'This [other] course explicitly dealt with methods that are implicit in the Political Theory course (PT) [current course] and therefore build an important foundation. Definitions in particular proved to be central to understanding in PT. In Introduction to Social and Political Sciences, I learned the structure, the function of definitions and also the importance of constructing definitions myself. How essential definitions are for any argument in political science became evident for me in the recent discussions and assignments in PT.' [The student continues with an illustration.]

Contextualisation Courses are connected because knowledge gained in the current course is used to better or differently understand knowledge from another course. *Example*: 'In retrospect, the political theory class also helps me to understand content of other courses. In the Introduction to Humanities, we discussed the Marxist analysis of culture, but only after reading the Communist Manifesto, I understood the important concepts of Marxist materialism.'

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