

THE GLOCAL CURRICULUM

*A PRACTICAL GUIDE TO TEACHING AND LEARNING
IN AN INTERCONNECTED WORLD*

Beatrice John, Guido Caniglia, Leonie Bellina,
Daniel J. Lang, Manfred Laubichler

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A Practical Guide to Teaching and Learning in an Interconnected World

BEATRICE JOHN, GUIDO CANIGLIA,
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PREFACE

In the 21st century, higher education faces a number of substantial challenges. We need to educate a rapidly increasing number of students, as college and other degrees become a requirement for finding meaningful work in current and emerging economies that face the challenges of sustainable development. This is the challenge of scale. But even more importantly, we need to prepare students for the complexities of a highly interconnected and interdependent world so that they can act as informed and responsible citizens within a global society. This is the challenge of the curriculum. Both challenges are interconnected. We cannot address the problem of what and how we teach without knowing whom we teach.

The Global Classroom approach presented here is the result of an experimental process that started early in the 21st century when the two partner universities—Arizona State University (ASU) and Leuphana University in Lüneburg—embarked on jointly further developing their own trajectories of university reform. At both places, sustainability, as the global challenge for humanity in the 21st century, acts as an overarching guiding principle at all levels, for the university itself, and for its research and educational missions.

Another inspiration has come from a working group on curriculum reform at the Wissenschaftskolleg zu Berlin (Wiko) during the academic year 2009-10, headed by the late Yehuda Elkana, together with Manfred Laubichler and Yogendra Yadav. This group focused on what principles should govern the university curriculum in the 21st century. Among those were an emphasis on global contexts, complex systems, real-world problems, such as sustainability, and a strong disciplinary grounding in the context of inter- and transdisciplinary approaches.

It was in the context of these discussions that Manfred Laubichler (a faculty member at ASU and the Santa Fe Institute) began to work with Leuphana President Sascha Spoun and ASU Provost Robert Page on the idea of a Global Classroom inspired by the principles of the Curriculum Reform Project that would educate students at both universities in a digitally mediated setting. Encouraged by Wolfgang Rohe of Stiftung Mercator, Manfred Laubichler (ASU) and Nils Ole Oermann (Leuphana) developed a proposal, which was funded by Mercator in 2011. The project was strongly supported by the presidents of both universities, Michael Crow (ASU) and Sascha Spoun (Leuphana). Robert Page, as Provost at ASU, helped to clear away all kinds of administrative red tape. Subsequently, Manfred Laubichler and Daniel J. Lang, who had joined Leuphana's Faculty of Sustainabili-

ty, led a broadly interdisciplinary team in developing and executing the project. This team included faculty from a range of disciplines (see below) and the project coordinators—the co-authors of this volume. As the following pages amply demonstrate, the students who participated in the Global Classroom also became major contributors in the development of the curriculum. They were willing and enthusiastic participants in this experiment.

So what is the Global Classroom? As we said, at the beginning was the idea that we need to find a way to actually implement the results of the Wiko working group. But, as with all good experiments, the eventual outcome turned into something much more. The Global Classroom experiment demonstrated that it is indeed possible to implement curricular innovations that focus on real-world problems, complexity thinking, and the deeply contextual nature of knowledge in the world.

Our students—from different cultures and with different life experiences and values—found a way to incorporate these factors in a productive and creative way into their learning environment and research projects. As we found out, this is not easy, but it is definitely worthwhile. But in acknowledging the importance of cultural differences and different life experiences we also learned that the social and communicative competencies, especially intercultural competence—which are often theorized about and proposed as desirable outcomes, but rarely if ever incorporated into traditional academic programs—were absolutely crucial to the success of the Global Classroom.

So we, together with our students, learned how to recognize these factors and how to integrate them into the curriculum for the Global Classroom program as well as the actual day-to-day operations of such a project. The following pages are the essence of the practical skills and lessons learned throughout the six years from its first conception to completion of the Global Classroom experiment.

We wrote this manual for instructors and students who are planning to start their own experiments in global learning that at the same time acknowledge the relevance of local context. It is our hope that our experience can inspire others to undertake such initially difficult, but ultimately rewarding and most importantly crucial efforts in an increasingly complex world.

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Guido Caniglia's interests revolve around the epistemology of transformational sustainability science, with a focus on forms of local experimentation, and the internationalization of the curriculum in higher education for sustainability. As a member of the Global Classroom team from the very beginning, Guido contributed to the process of envisioning, conceptualizing, implementing, and assessing the glocal curriculum and teaching-learning environment, which is reflected in Part 1 of this Handbook. In 2010, Guido earned a PhD in philosophy from the University of Florence (Italy) while working in different academic communities, mostly in Italy, Germany, Spain, and the United States. In January 2016 he obtained a second PhD, this time in biology, from the Center for Biology and Society at Arizona State University (USA).

Leonie Bellina is a scholar-activist and teacher in the field of postcolonial political ecology. Her research areas are environmental justice and sustainability, sustainable food systems, and emancipatory education. She joined the Global Classroom in 2013 as project coordinator, researcher, and instructor, where she contributed to developing the project in all its aspects. Eventually, her focus became curriculum design for the multi-dimensional competencies students as future "change agents" may need, which is reflected in Part 2 of this Handbook. She was also the curriculum developer for the international Master's program in Global Sustainability Science (Leuphana/Arizona State University), which evolved out of the Global Classroom. Leonie holds a BA in Sustainable Human Development from Naropa University (Boulder, CO, USA) and an MA in Postcolonial Cultural Anthropology and

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Daniel J. Lang was a principal investigator and instructor in the Global Classroom. Since 2010 he has been Professor for Transdisciplinary Sustainability Research at the Faculty of Sustainability of Leuphana. Daniel was dean of this faculty between 2012 and 2016 and Dean of Studies of the Leuphana Semester and Complementary Studies between 2010 and 2012. Since 2016 he has been the President's Special Advisor for Sustainability at Leuphana. Furthermore, since 2015 he has been one of the Academic Directors of the Double Degree Master's Program in Global Sustainability Science of Leuphana and ASU, which was developed based on the insights from the Global Classroom. This program is hosted at the Center for Global Sustainability and Cultural Transformation (CGSC), of which Daniel is a director. The main focus of his work revolves around the further development of the theoretical, methodological, as well as process-related foundations of sustainability science. This research focus is also reflected in his teaching activities in which project-based learning as well as methods for inter- and transdisciplinary research play a major role.

Manfred Laubichler was a principal investigator and instructor in the Global Classroom. Manfred is President's Professor of Theoretical Biology and History of Biology at Arizona State University, a Professor at the Santa Fe Institute, and a Visiting Professor at Leuphana University Lüneburg. His undergraduate training was in zoology, philosophy, and mathematics at the University of Vienna (Austria), and his graduate training was in biology at Yale University and in History/History of Science at Princeton University. At ASU he directs the Global Biosocial Complexity Initiative and is a Distinguished Sustainability Scientist in the Global Institute for Sustainability. He is editor of *Theory in Biosciences* and associate editor of *Biological Theory* among other editorial roles. He is also a visiting scholar at the Max Planck Institute for the History of Science in Berlin and an external faculty member at the Konrad Lorenz Institute for Evolution and Cognition Research in Altenberg, Austria. Manfred is an elected fellow of the American Association for the Advancement of Science and a former fellow at the Wissenschaftskolleg zu Berlin.

INTRODUCTION

Imagine what would happen if students from all over the world, from different geographical and cultural contexts, were able to learn together how to address the pressing sustainability issues of our time, from loss of biodiversity and climate change to rapid urbanization and pandemics. Students could work on joint research questions related to sustainability in their own different environments while collaborating with instructors from different cultures and nationalities. They could learn about the local nature of sustainability problems while dealing with the interconnections of these problems on a global scale. Students would feel empowered to contribute to social change and transformation in the context in which they live and work, while building alliances with peers across social, cultural, and geographical boundaries. They could learn to capitalize on synergies and differences and thus contribute to a more sustainable future.

Imagine

This situation might seem utopian to most administrators or instructors working in higher education. Yet, in the Global Classroom project, we tried to turn this utopian idea into a reality. During the course of three years, we worked together with students from Germany and the United States on sustainability problems and solutions in the urban environments of Lüneburg/Hamburg (Germany) and Tempe/Phoenix (Arizona). In this transnational collaboration between Arizona State University and Leuphana University Lüneburg, we experimented with different formats, teaching concepts, pedagogical approaches as well as different technological equipment and forms of engagement with, for instance, stakeholders in local communities. The goal of these experiments was always the same: finding out what formats and approaches could be used in the context of a transnational collaboration that would prepare and empower students to become critical citizens who are willing to engage with people from other cultures and nationalities to address pressing sustainability challenges of our time.

Leuphana University
Lüneburg and Arizona
State University

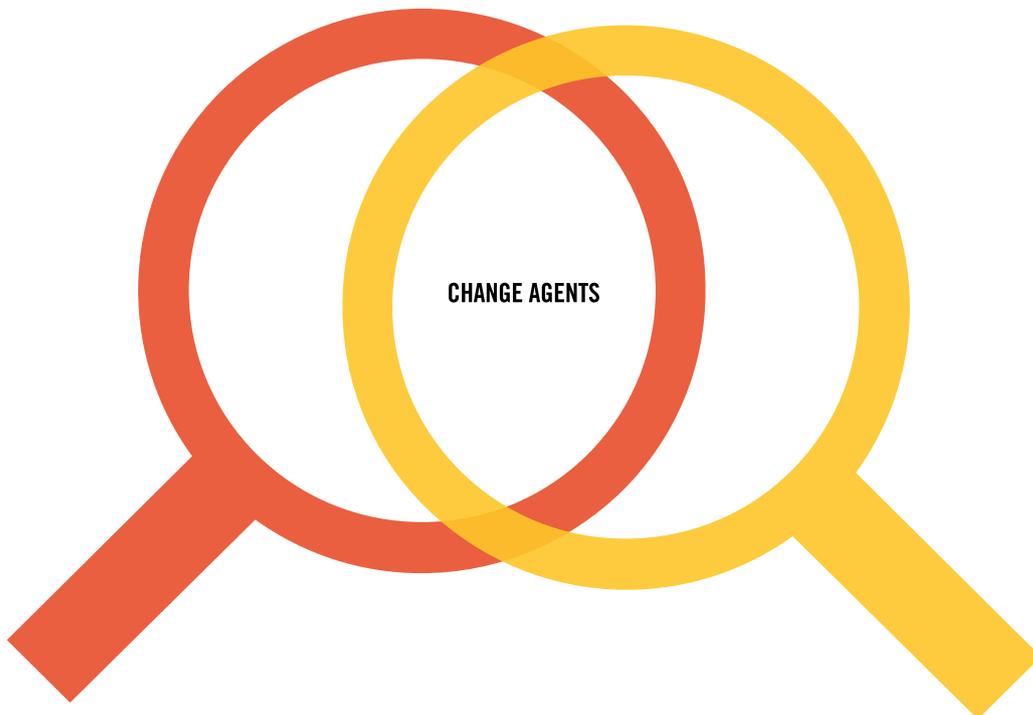


Change agents

Scholars and practitioners have defined in many different ways the kind of citizens that we aimed to prepare. Many, above all in higher education for sustainable development, have talked about change agents (e.g. Svanström, Lozano-García, & Rowe, 2008). Others, more often in the humanities, define them as critical citizens or concerned citizens (Gandin, Apple, & Au, 2009). When we talk about change agents in this Handbook, we rely on both these traditions and mean those citizens who can combine critical and transformative mindsets, knowledge, and skills in order to address the sustainability problems of the 21st century. The resources and reflections that we present here include teaching and learning formats, activities, and environments that we developed to support the education of change agents who are willing to critically and creatively contribute to sustainability transformations, and are able to do so in a world in which the global and the local are increasingly interconnected.

Critical and transformative approaches

A variety of approaches is available that aims to foster the education of such citizens in fields as diverse as higher education for sustainable development, global health (Hesselbarth & Schaltegger, 2014; Svanström et al., 2008) as well as from the humanities, philosophy, and critical pedagogy (Freire, 1996). In the Global Classroom, we combined and integrated several of these approaches. On the one hand, we produced an educational experience that can help students to think critically about processes of knowledge production and power relations as well as about the historical and present dynamics that have resulted in an unsustainable world. On the other hand, we wanted to provide students with the knowledge, skills, mindsets and competencies that could enable them to collaborate across disciplinary, social, and cultural boundaries to produce transformation and change in our contemporary society (Barth, 2013, 2015; Barth & Michelsen, 2013; Moore, 2005). The result of combining these two attitudes is what we present in this Handbook.



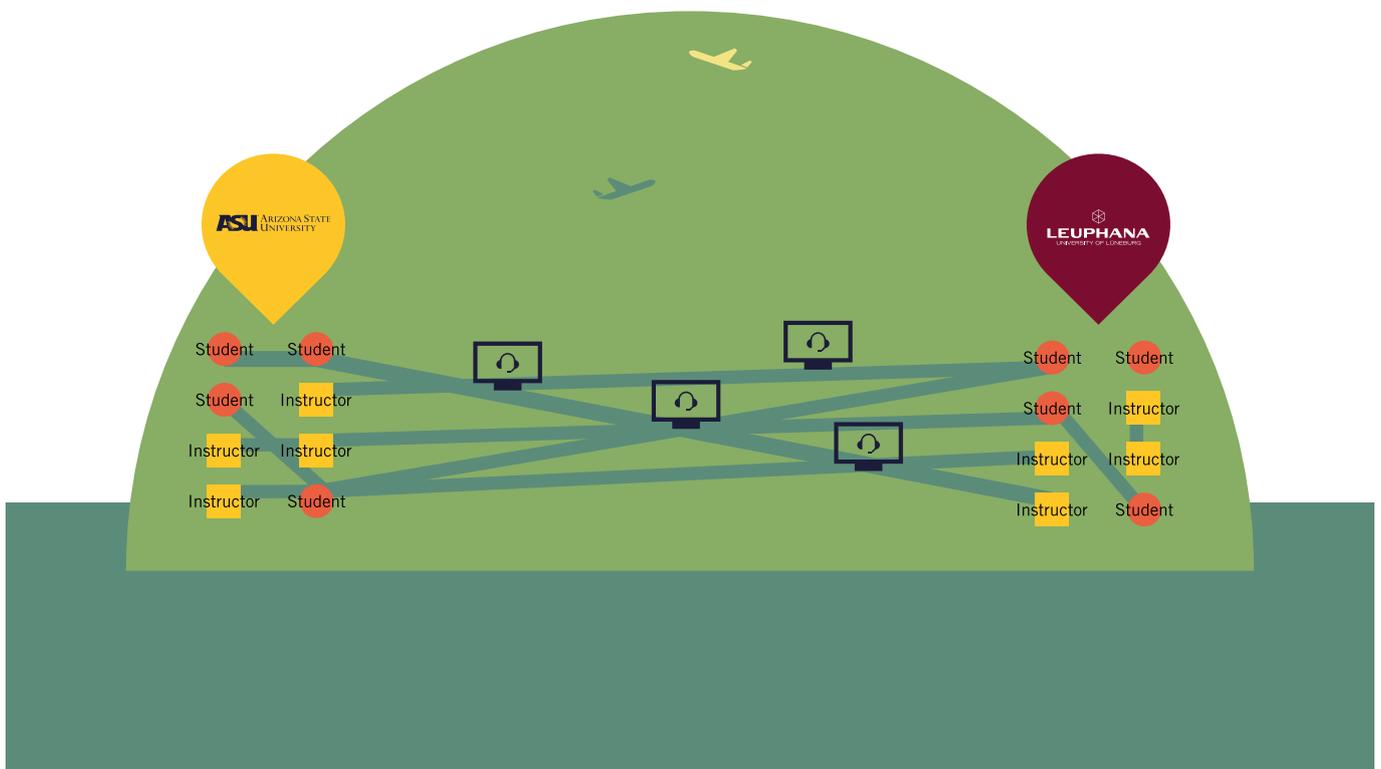
Transnational collaboration projects, such as the Global Classroom, offer unique opportunities for the education of change agents in our globalized societies. They can enable us to prepare students to work towards social change across cultural and geographical boundaries (Leask, 2009). They also make it possible to move beyond the distinction between global and local and provide a unique space to understand and find solutions to pressing sustainability problems that are global, but are substantially different in different local contexts. The mix of global and local that characterizes our approach to transnational collaboration led us to conceptualize our teaching and learning model as *glocal*. Merging global and local means bringing together local learning, engagement, and impact with global communication, collaboration, and knowledge production. This process takes place across social, cultural, and geographical boundaries and involves the way students learn about the world as well as how they learn to act responsibly in it.

Transnational collaboration projects

Glocal teaching and learning

Traditional forms of internationalization have made use of physical mobility as the main tool to bring students from different cultures and nationalities in touch with one another. More recently, forms of virtual mobility—say, the use of digital and virtual technologies—have offered more and more opportunities to connect students from different cultures and geographical contexts (Barth & Burandt, 2013; Cörvers, Leinders, & van Dam-Mieras, 2011). In the Global Classroom, we combined virtual and physical mobility. We brought together e-learning, study trips, and blended learning formats to connect students and instructors on different continents. Using multiple tools and approaches, we gave a new meaning to the idea of *glocal* and afforded students the opportunity to learn and produce knowledge together across cultural and geographical boundaries.

Internationalization and digitalization



This Handbook represents both the end of an experience, the initial Global Classroom experiment, and, we hope, the beginning of many others: the ones that might be informed by the resources and reflections of this Handbook. Our hope is that it will inspire instructors and administrators around the world to set up transnational collaboration projects similar to the Global Classroom. We also hope that this Handbook will provide viable ideas for those who work in countries or institutions with limited resources for the development of transnational collaboration. We finally hope that instructors and administrators from fields as diverse as urban planning, civic engineering, and health studies that deal with real-world problems and the difficulties of addressing them across cultural and geographical boundaries will find our resources and reflections useful.

WHAT WAS THE GLOBAL CLASSROOM PROJECT?

Origins and history of this Handbook

See Background Box 1

See Figure 1

During the academic year 2009-2010, an international group of scholars at the Institute of Advanced Studies in Berlin (Wissenschaftskolleg zu Berlin) produced the Curriculum Reform Manifesto. It asked the fundamental question how to rethink higher education in the 21st century and informed “The Global Classroom: Liberal Arts Education in the 21st Century”. Leuphana University Lüneburg, in Germany, and Arizona State University, in the United States, then realized the Global Classroom as a transnational study program. The main aim of this collaboration was to experiment in how to realize the vision of the Curriculum Reform Manifesto. Students and instructors from Leuphana University and from Arizona State University designed, implemented, and assessed together a new curriculum as well as a new teaching-learning environment for the education of change agents in the world of the 21st century (Rowe & Hiser, 2016). A team of researchers conducted formative and summative evaluation of the Global Classroom projects over the three years of its duration. The resources and reflections offered in this Handbook are based on both of these processes.

GLOBAL CLASSROOM - FACTS

Participating universities: Arizona State University (ASU) (in USA) and Leuphana University Lüneburg (in Germany)

Departments: School of Life Sciences and School of Sustainability at ASU; Faculty of Sustainability, Faculty of Humanities and Social Sciences, and Leuphana College at Leuphana

Funding: Stiftung Mercator (<https://www.stiftung-mercator.de>)

Duration: from August 2012 to September 2016

Number of students involved: 72 students in 2 cohorts. The students participating in the program majored in 7 different subjects. The first cohort of students started in January 2013. Their experiences informed and shaped

the planning of the second cohort, who then started in the January of the following year.

Topic of the program: “Sustainable Cities: A Contradiction in Terms?”

Duration of the program: 3 semesters at ASU (12 Credit hours) 3.5 semesters at Leuphana. (30 ECTS)

The program in the two institutions: At Leuphana, the Global Classroom became part of the complementary studies program, general elective courses taken each semester in addition to the students’ major and minor programs of study. At Arizona State University, students from different majors could use the Global Classroom to fulfill different requirements in their own programs, from history to global health, biology, and sustainability.

Online: www.leuphana.de/college-global-classroom

Background Box 1 Global Classroom - facts

In the Global Classroom, we addressed issues in urban sustainability, such as the effects of climate change in cities, the complex dynamics in the historical development of cities, as well as sustainable urban food systems, and the role of arts and culture in making cities more sustainable. We relied on transformative teaching and learning concepts that aim to enable radical change in students rather than to reproduce existing patterns of thought (Brundiers & Wiek, 2011; König, 2015; Sipos, Battisti, & Grimm, 2008). We combined the use of teaching concepts stemming from multiple approaches, from critical pedagogy and the history and philosophy of science as well as experience-based, problem and project-based learning approaches from sustainability science, anthropology, and the arts (Caniglia et al., 2016; Hmelo-Silver, 2004; Kagan, 2013). Students actively engaged in pursuing their own research projects in real-world settings using these approaches. In these projects we emphasized the solution orientation of their research through research questions, participation in communities of practice, as well as in the communication and dissemination of research results while continuously critically reflecting on their processes and outcomes (Jerneck et al., 2010; Wiek & Kay, 2015; Wiek, Xiong, Brundiers, & van der Leeuw, 2014).

Topics on urban sustainability

Research in real-world settings

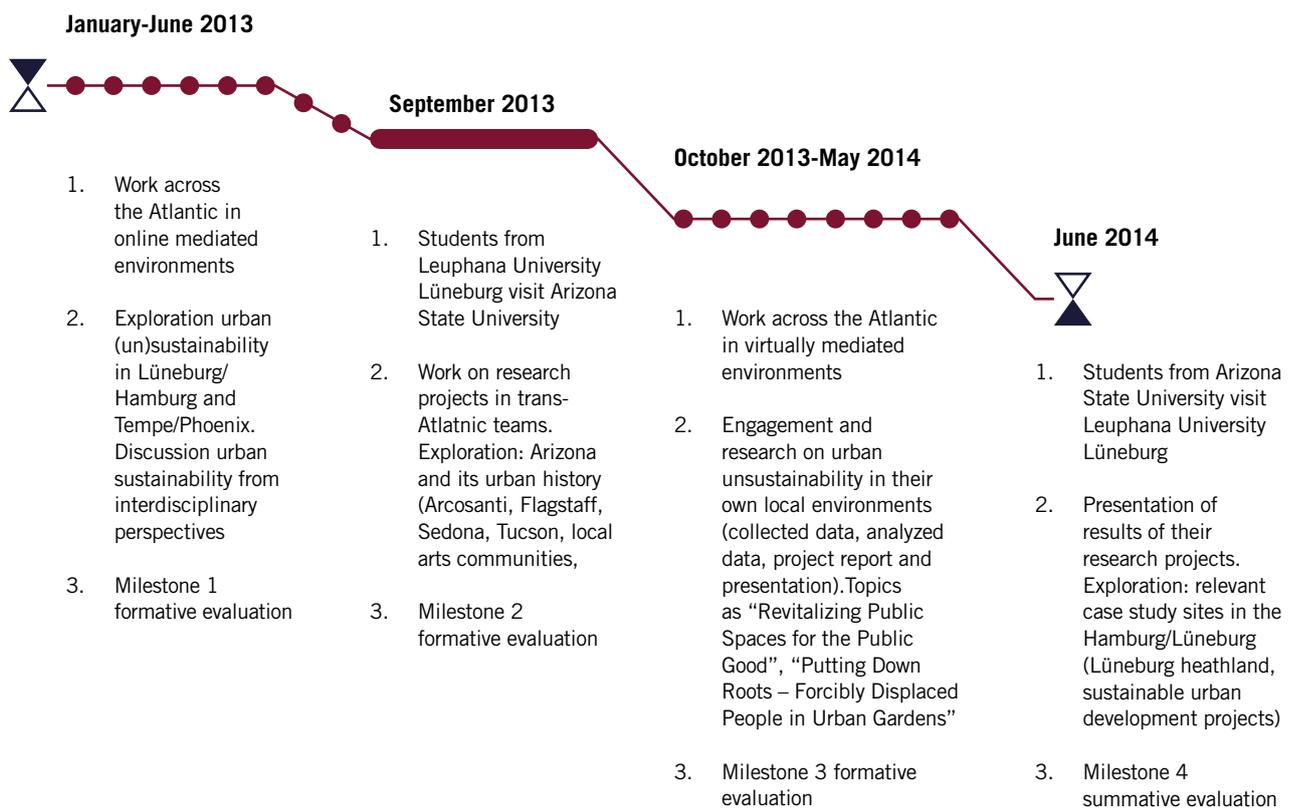


Figure 1 The Global Classroom program (first cohort students 2013-2014)

WHAT IS IN THIS HANDBOOK?

Our Handbook covers different stages, from envisioning the original reform initiative and its design to implementing and evaluating the curriculum as well as the teaching-learning environment. The Handbook is informed by the results and experiences we have gained working together in the Global Classroom project. Accordingly, the Handbook has three parts:

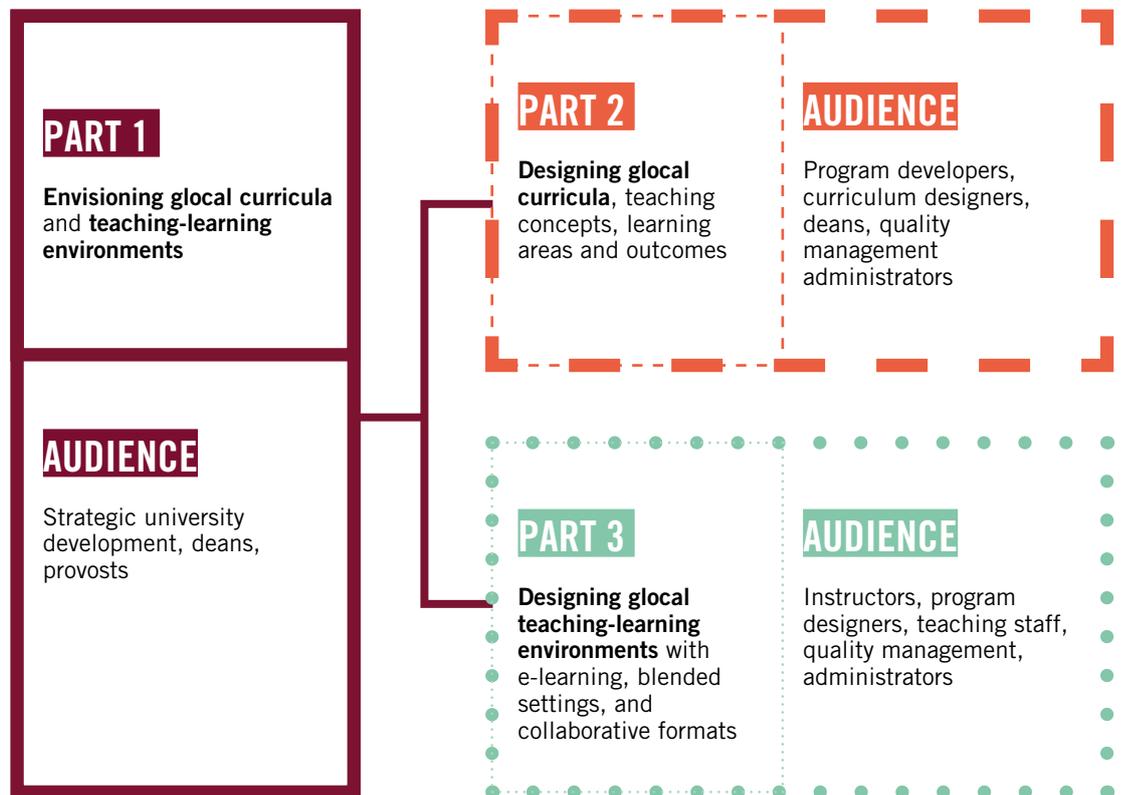


Figure 2 Outline of the handbook and its intended audience

PART 1 -CREATING GLOCAL VISIONS

Main contributions by Guido Caniglia

In this chapter we present the basic ideas underlying glocal teaching and learning as well as how to envision glocal curricula and teaching-learning environments. We address questions such as:

- What exactly are *glocal* teaching and learning?
- How can you think about the curriculum? How can you envision a glocal curriculum in the context of transnational collaboration?
- How can you think about a glocal teaching-learning environment in which the curriculum is embedded? How can you envision environments where students develop their knowledge, skills, and personalities by engaging with sustainability problems in the context of transnational collaboration?

PART 2 -DESIGNING GLOCAL CURRICULA AND PROGRAMS

Main contributions by Leonie Bellina

In this chapter we present how the vision of a glocal curriculum can be concretely implemented. In this part we address the following questions:

- How can you translate the vision and goals of a glocal curriculum in a structured manner to design your own curriculum? What components and teaching and learning concepts are needed to enable learning across the wide range of change-agent competencies?
- How can you design a glocal program of study? What are differences to conventional programs, and how can these be successfully addressed?
- How can you scale the glocal curriculum from one course to a minor to a full program of study? How can you apply our model curriculum to bachelor's as well as master's degree programs?

PART 3 - DESIGNING GLOCAL TEACHING-LEARNING ENVIRONMENTS

Main contributions by Beatrice John

This chapter gives details on designing the appropriate teaching-learning environment for realizing the goals of the glocal curriculum. Here we address the following questions:

- What are the dimensions of an effective teaching-learning environment and how can you shape them in a glocal setting?
- How can instructors and teaching staff reflect and plan an environment that supports collaboration in innovative settings with e-learning technologies?
- What are the roles and processes in this new teaching-learning environment instructors and students are engaged in?

WHO SHOULD READ THIS HANDBOOK?

Practical guidance for
three audiences

In this Handbook we offer results, reflections, and guidance that are of interest for:

- *Administrators, executives, and provosts* who want to develop new strategies for teaching and learning in transnational collaboration and are in search of inspiration and guidance. Above all, we hope this book will encourage the development of new collaboration efforts between institutions around the world.
- *Deans, curriculum developers, and program designers* who are looking for practical advice on how to rethink and redesign their curriculum within transnational collaboration in different fields that engage real-world problems, from sustainability sciences to global health and urban planning.
- *Instructors, teaching staff, and everybody* who is interested in planning a coherent teaching and learning experience for students in the context of transnational collaboration. Teaching has always been an essential part of life in academia, but instructors are often autodidacts. This book offers concepts, ideas, and support for those wishing to adapt and develop their teaching to meet the challenges of the 21st century.

PRINT-ON-DEMAND AND OPEN ACCESS

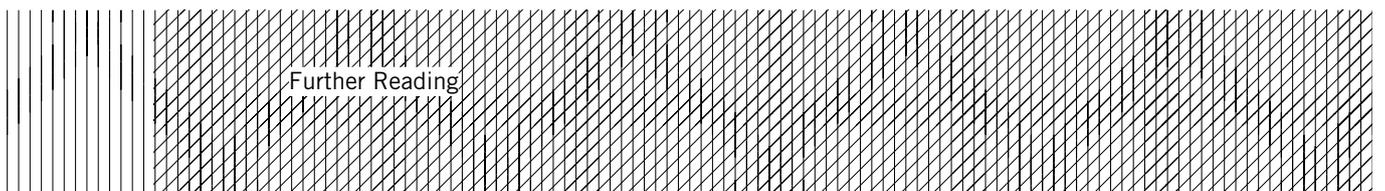
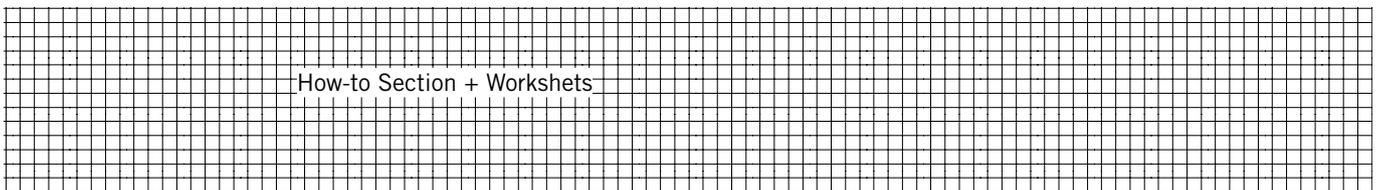
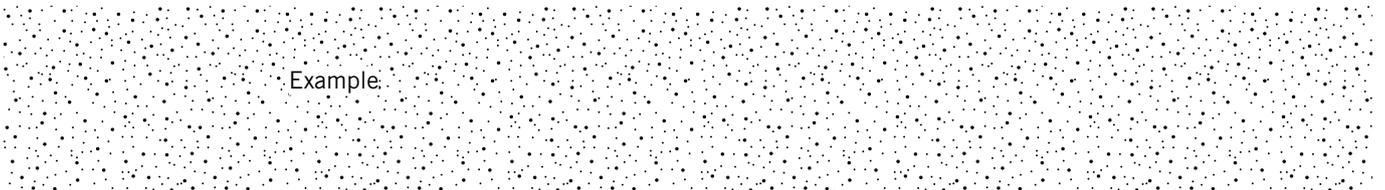
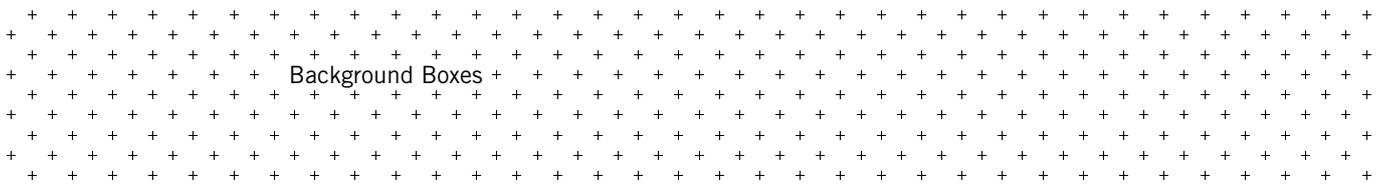
Our Handbook will be accessible to everybody independently from geographic location or availability of resources. We hope that readers and users will contribute to the further development, implementation, and evaluation of the ideas and resources presented here.

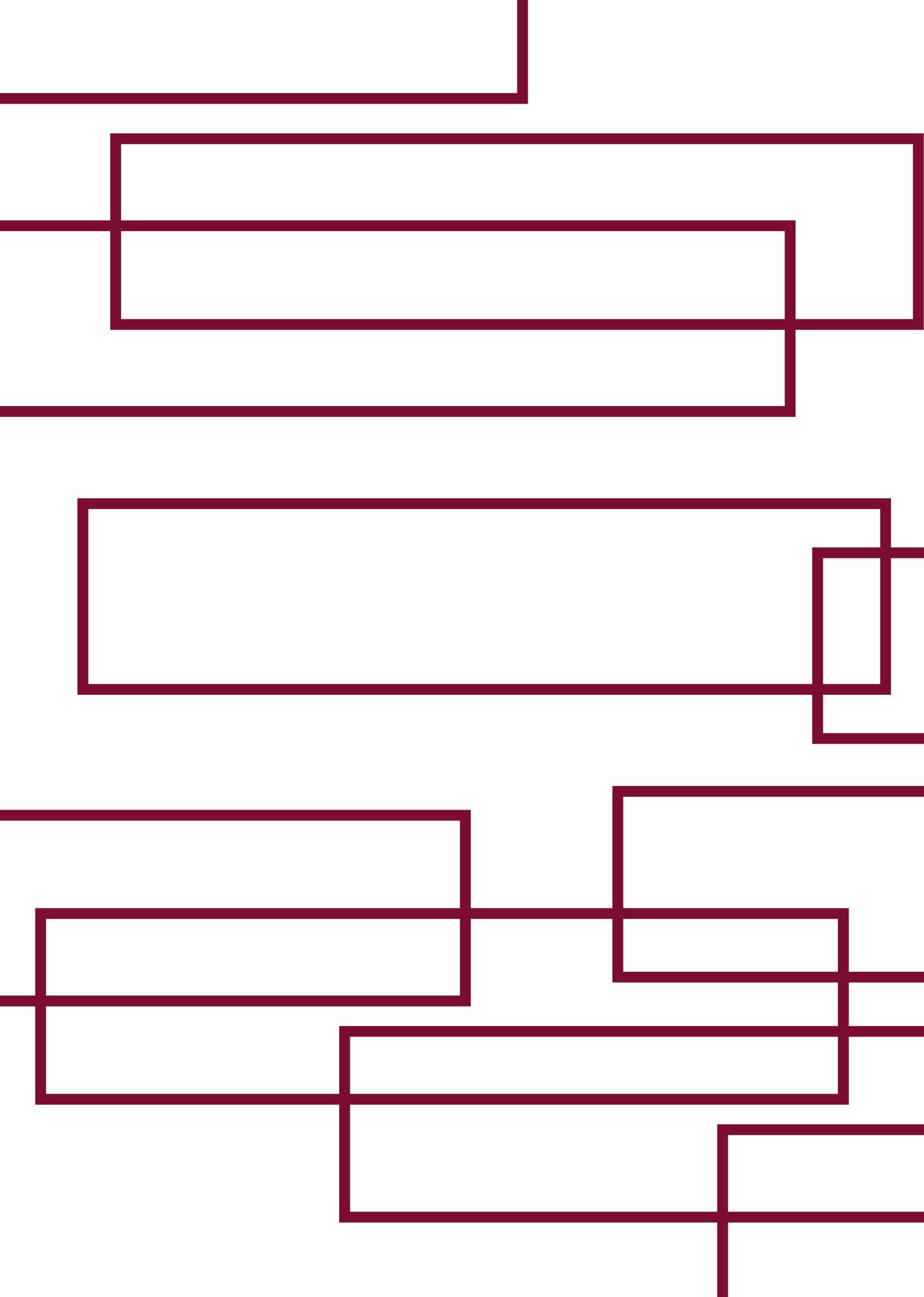
HOW CAN YOU MAKE USE OF THIS HANDBOOK?

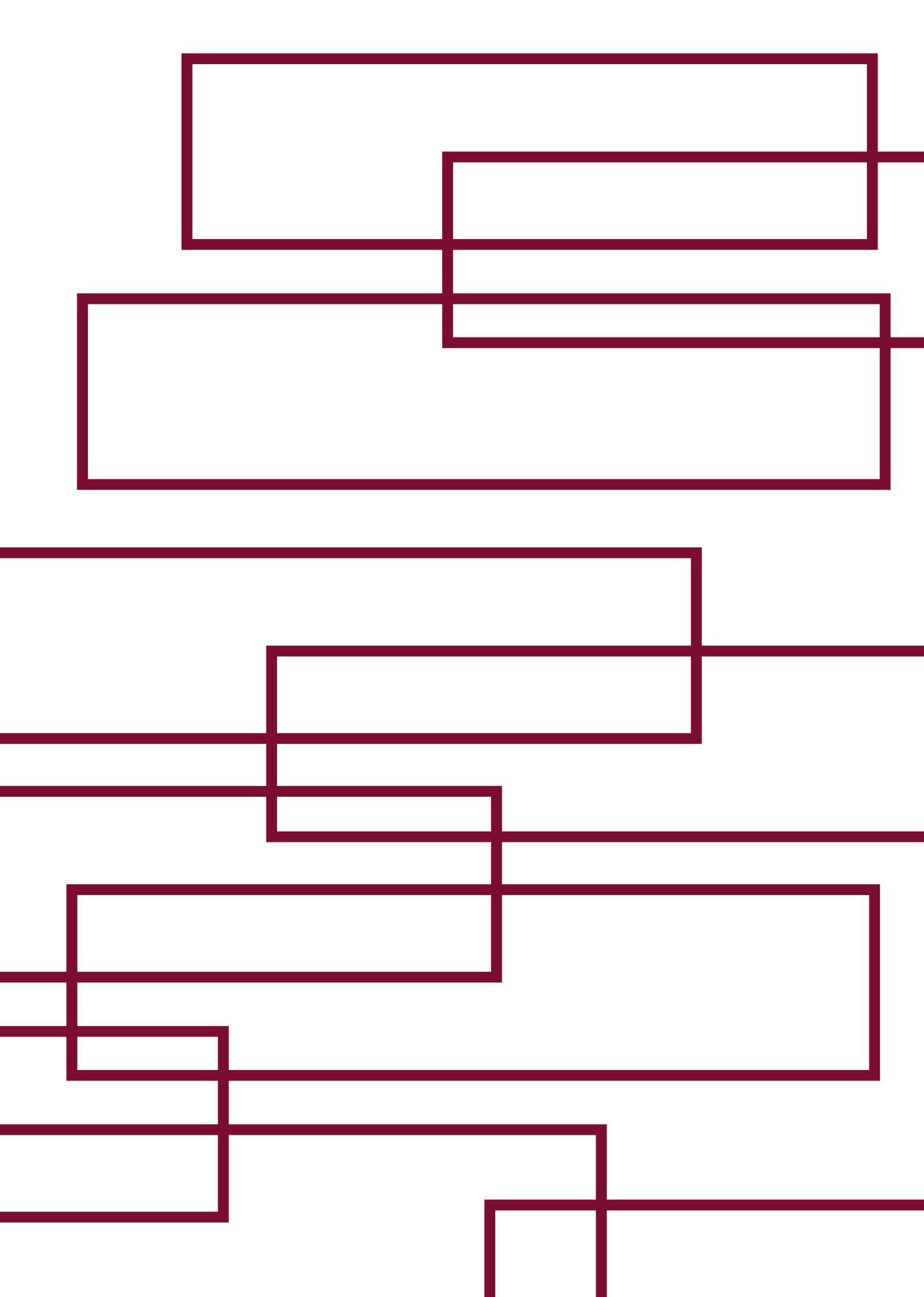
We hope this book will serve as workshop-like support in your endeavors. We invite you to adapt it to your needs, to the context in which you are working, and to the time that you have at your disposal.

Each part of the Handbook introduces topics and ideas and at the same time provides reflections and resources for their future implementation. Different topical elements should help you find the information or resources you are looking for. The *roadmap* along the margins of the entire book consists of hints, icons, and keywords that direct you immediately to what you are looking for. The *How-to* sections and *Worksheets* provide quick guidance to operationalize the ideas presented. The *Further Reading* sections present sources, websites, books, and projects that deepen the understanding of a certain area and provide you with examples. The *Background Boxes* offer insights from literature and research in the field adapted to our context, and *Examples* show our experiences at Leuphana University Lüneburg and Arizona State University with the Global Classroom project.

Key of graphical elements







PART 1 - CREATING GLOCAL VISIONS

Before embarking on planning the details of a transnational collaboration project, it is important to craft a vision of the kind of educational experience you would like to offer to your students, the curriculum, and the environment that can support the implementation of such a curriculum, the teaching-learning environment. This vision will lead you through the whole process of designing and implementing your curriculum.

Definition of a vision

A vision represents a desirable state in the future. For your transnational collaboration, this means creating a desirable curriculum as well as a desirable teaching-learning environment where your curriculum can be implemented in the context of your institutions. Your vision will contain the main elements that matter to you and your colleagues. By having a vision that is both desirable and realistic at the same time, you will be able to move on to designing and implementing your curriculum as well as your teaching-learning environment.

See Part 2

See Part 3

In Part 1 we use insights from the Global Classroom project to provide resources, examples, and critical reflections that can help you in the process of creating a vision for existing or future transnational collaboration projects that will help empower students to address real-world sustainability problems of the 21st century. Depending on the kinds of institutions involved in the collaboration as well as on other possible economic, cultural, or legal constraints, you will have to adapt the resources and reflections we present here to your specific situation. Yet, we believe that this Handbook will provide a foundation for you to craft a desirable and realistic vision for your curriculum.

Definition of glocal

See Background Box 2

We define our approach to teaching and learning as *glocal*. The term *glocal* has been used in multiple and often contradicting contexts. Our definition captures the importance of integrating both local and global considerations when addressing the pressing real-world sustainability problems of our time. A *glocal* curriculum combines local and global aspects in the learning experience of the students as well as in the teaching experience of instructors. A *glocal* teaching-learning environment organizes spaces, places, and people so as to allow students to learn how to address real-world sustainability problems in local and global contexts.

THE IDEA OF GLOCAL

According to *The Oxford Dictionary of New Words*, the term glocal is “formed by telescoping *local* and *global* to make a blend” (Knowles & Elliott, 1991). In itself, this notion doesn’t have any social, political, or ideological dimension. Yet, it has been used in many different contexts (Robertson, 1995). On the one hand, the social justice movement and the anti-globalization movement in the 1990s and early 2000s used the notion of glocal to point out the importance of valuing and leveraging local contexts in a

globalized world. In the context of political activism (e.g. Greenpeace, Attack), the slogan “Think Global, Act Local” represented one of the ways of stressing the importance of considering both local and global dimensions when criticizing different manifestations of political and economic globalization. On the other hand, the idea of glocal has also been used as synonym of *micromarketing*. Glocalization is a marketing strategy used mostly by big corporations (e.g. McDonald’s) that focuses on adapting international products and goods to the particular features of the local contexts and cultures where they are sold.

Background Box 2 The idea of Glocal



Figure 3 Concept of a glocal education

Figure 4 shows the concept of the relationship between a glocal curriculum and teaching-learning environment in our interconnected world of the 21st century. The triangle represents the curriculum with three dimensions of acting knowing and being. The bubbles that converge around the triangle represent a teaching-learning environment in which local and global as well as virtual and real intersect in unclear and unpredictable but also colorful and hopeful ways.

A *glocal curriculum* sequences teaching-learning experiences so that the students can develop the knowledge, skills, and mindsets to learn from one another and to produce knowledge together about the causes of and solutions to sustainability problems across different geographical and cultural contexts.

A *glocal teaching-learning environment* supports the implementation of a glocal curriculum by making use of spaces, places, and people in local and global settings so that students can learn how to learn from one another and how to produce knowledge together about causes of and solutions to real-world problems across different geographical and cultural contexts.

See Figure 3

Definition of glocal curriculum

Definition of glocal teaching-learning environment

1.1 ENVISIONING YOUR TRANSNATIONAL COLLABORATION

Participants in the visioning process

Many people will be part of the process of envisioning the curriculum and teaching-learning environment in your transnational collaboration project. This includes primarily the instructors involved in teaching the curriculum and your students, but also people working in the administration and curriculum designers. It is important that all of these people share the vision of your curriculum. By having a shared and realistic vision, you will be able to better understand the obstacles that are actually in the way of its implementation as well as what it will take to achieve that vision. In creating your vision, you will address the following questions:

Questions driving the visioning process

- What does it mean to think in glocally about transnational collaboration? What is glocal about your vision of teaching and learning?
- What is important to you in the curriculum? How can you create and assess a vision for a glocal curriculum in the context of your own transnational collaboration project?
- How can you embed the curriculum in a glocal teaching-learning environment? How can you create and assess a vision for a glocal teaching-learning environment in the context of your own transnational collaboration project?

1.1.1 The Three Dimensions of Glocal

See Figure 4

Our understanding of *glocal* has three main dimensions: (a) ontological, or what is in the world and how it works; (b) epistemological, or how we know the world; and (c) normative, or how we act or should act in the world. All three of these dimensions are important in envisioning the curriculum and teaching-learning environment in the context of your transnational collaboration project.

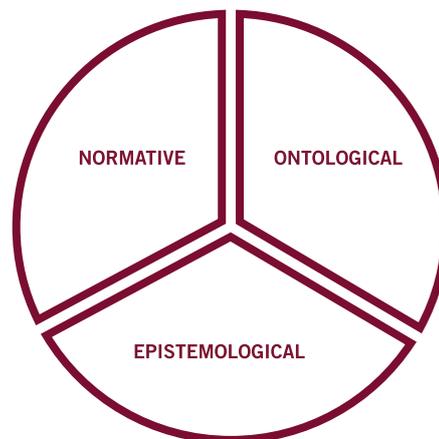


Figure 4 The three glocal dimensions

The idea of glocal signifies how local and global realities are interconnected in our contemporary world, especially in the sustainability problems we are confronted with.

Ontological dimension

The idea of glocal is ontological in that it is about the processes, dynamics, events, and entities that make up the world we live in. This ontological dimension is spatial in its reference to the different scales of resolution—e.g. from local to regional and from national to global—characterizing the world in which we live as well as how real-world sustainability problems are manifested in it. As the relationship between different scales varies over time, the notion of glocal also has a temporal and historical dimension.

On a more concrete level, pointing out the ontological dimension of glocal acknowledges the fact that the key sustainability challenges of the 21st century—from climate change to biodiversity loss—are global, but they manifest themselves in different ways in different local contexts. For instance, climate change causes droughts in a desert city like Phoenix in Arizona and floods in northern Germany, just to mention the two environments where our Global Classroom took place. It also acknowledges that local contexts are highly interconnected in a globalized world. What people do in Phoenix will have effects that cannot be easily foreseen in other local contexts, such as Hamburg.

The idea of glocal signifies that how we know the world has to increasingly connect local and global considerations, especially when we produce knowledge about the sustainability problems we are confronted with and their solutions.

Epistemological dimension

The epistemological dimension of glocal signifies a shift from universal and general knowledge to ways of conceiving of knowledge and its production that are historically, culturally, and locally specific, yet still interconnected on a global scale. This means that if we want to understand how we produce and validate knowledge we will always have to look at knowledge as something located in specific historical, cultural, social, and geographical contexts.

See Background Box 3

On a more concrete level, this means that when we try to understand how to find solutions for the manifestations of climate change in urban environments, it would be highly unlikely if we found one solution that fits all contexts. On the contrary, it will be important to pay attention to how different kind of knowledge, both about problems and about solutions, emerge in different contexts. We will have to think carefully about how to transfer them from one context to the other. In the Global Classroom, for instance, we had to think about whether and how what we knew about the effectiveness of solutions to sustainability problems in Phoenix could be transferred to northern Germany, and vice versa.

ELKANA'S GLOBAL CONTEXTUALISM

In the book *The University in the Twenty-first Century: Teaching the New Enlightenment in the Digital Age*, the historian of science and education theorist Yehuda Elkana introduces the idea of *global contextualism*. Elkana's idea of global contextualism explores both the epistemological and ethical dimensions of the idea of *glocal*. Elkana

argues for a new enlightenment and writes: "Thus in our opinion we need no less than a 'New Enlightenment' based on the principle 'from local universalism to global contextualism', which stems from the idea that interpreting knowledge is never value-free nor independent of context. It requires greater emphasis on reasonableness, commonsense, pragmatism, and real-life situations" (Elkana & Klöpper, 2016).

Background Box 3 Elkana's global contextualism

Normative dimension The idea of glocal signifies that, in addressing sustainability problems, we must increasingly interlink local and global considerations, both when we think about how we should act and when we consider the effects of our actions.

The normative dimension of glocal is closely related to the ontological and epistemological dimensions. If (a) the world in which we live—and the problems it presents—increasingly interconnects local and global dimensions, then (b) the knowledge that we produce about it must also be both local and global, and (c) we must keep in mind the consequences of our actions on both a local and a global scale. This also means that it is important to take into account local cultures and values when thinking about global sustainability problems.

1.1.2 Glocal Internationalization

See Background Box 4 Collaboration efforts require the coordination of different people—from program leaders and curriculum developers to instructors and students. Institutional internationalization through the establishment of such collaboration projects becomes the means for developing and implementing innovative models of education. Institutional processes of internationalization provide the kind of structure for envisioning and implementing glocal curricula and teaching-learning environments

Collaboration in internationalization The idea of glocal with its ontological, epistemological, and normative dimensions has important implications for how we conceive of teaching and learning. In general, our educational models should engage the knowledge, skills, and mindsets that are needed to bridge from local to global and from global to local in understanding and providing solutions to real-world problems. More concretely, this means that we should provide students with the opportunity to experience and then compare and understand the interconnections between different local contexts on a global scale.

Dimensions in educational models Glocal teaching and learning promotes the development of knowledge, skills, and mindsets so that students can learn from each other and jointly produce knowledge about the causes of and solutions to real-world problems across different geographical and cultural contexts. A glocal education means collaborating and working across different geographical, political, linguistic, and cultural contexts so as to be able to learn and produce knowledge together about sustainability problems and their possible solutions.

INTERNATIONALIZATION

Internationalization can be thought of as a comprehensive strategy to advance research and education beyond a single country's borders. It describes joint efforts among scholars and researchers as well as university administrators to integrate international, intercultural, or global dimensions into the purpose, execution, and delivery of research and teaching (Altbach & Knight, 2007). Internationalization of higher education should equip students for the complex challenges of the 21st

century. Over the last decades universities have increasingly embraced internationalization as a key source of innovation, adopting institution-wide strategies to advance international collaboration (Kosmutzky & Putty, 2015). Internationalization is central to higher education in keeping up with society's ongoing globalization by shifting the focus of universities from a national towards an international perspective. Recent works on internationalization of the curriculum stress the importance of finding ways to connect local and global contexts (Jones, Coelen, Beelen, & de Wit, 2016).

Background Box 4 Internationalization of research and education

1.1.4 Further Reading

ON CURRICULUM REFORM AS WELL AS ABOUT THE ROLE OF THE UNIVERSITY IN THE 21ST CENTURY

Elkana, Y., & Klöpper, H. (2016). *The University in the Twenty-first Century. Teaching the New Enlightenment in the Digital Age.* (M. Lazerson, Ed.). Budapest: Central European University Press.

Barnett, R. (2010). *Being a University. Foundations and Futures of Education.* London: Routledge.

ON GLOCALIZATION, GLOBAL CONTEXTUALISM, AND THE INTERNATIONALIZATION OF HIGHER EDUCATION

Elkana, Y., & Klöpper, H. (2016). *The University in the Twenty-first Century. Teaching the New Enlightenment in the Digital Age.* (M. Lazerson, Ed.). Budapest: Central European University Press.

Robertson, R. (1995). Glocalization: Time-Space and Homogeneity/Heterogeneity. In M. Featherstone, S. Lash, & R. Robertson (Eds.), *Global Modernities* (pp. 25–44). London: Sage Publications.

Jones, E., Coelen, R., Beelen, J., & Wit, H. de (Eds.). (2016). *Global and Local Internationalization.* Rotterdam: SensePublishers.

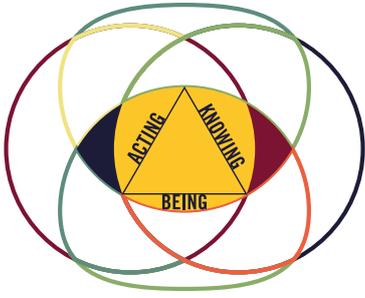
ON CHALLENGES AND STRATEGIES IN THE PROCESS OF INTERNATIONALIZATION

Jones, E., Coelen, R., Beelen, J., & Wit, H. de (Eds.). (2016). *Global and Local Internationalization.* Rotterdam: SensePublishers.

Altbach, P. G., & Knight, J. (2007). The Internationalization of Higher Education: Motivations and Realities. *Journal of Studies in International Education*, 11(3–4), 290–305.

Knight, J. (2004). Internationalization Remodeled: Definition, Approaches, and Rationales. *Journal of Studies in International Education*, 8 (1), 5–31

Kosmutzky, A., & Putty, R. (2016). Transcending Borders and Traversing Boundaries: A Systematic Review of the Literature on Transnational, Offshore, Cross-Border, and Borderless Higher Education. *Journal of Studies in International Education*, 20(1), 8–33.



Drivers for the envisioning

1.2 ENVISIONING YOUR GLOCAL CURRICULUM

Economic and political interests are often put in the foreground in discussions about internationalizing the curriculum while organizational and administrative aspects of international collaboration are prioritized as the most urgent. The result is that questions that should be driving the process of creating a vision are often neglected. Here, we focus on such fundamental questions as: What kinds of knowledge should students engage with if they are to critically address real-world sustainability problems? And what kind of mindset and image of themselves should students develop in our transnational collaboration projects? Keeping such questions in mind from the beginning can help you craft a vision of the curriculum that (a) is centered around the students and their needs, (b) takes into account different dimensions of life and learning, and (c) is realistic and feasible.

1.2.1 The Curriculum and its Dimensions

Inspirational work

Before talking about what it takes to envision a glocal curriculum, it is important to be clear about what we exactly mean by curriculum. Of course, there are many serviceable definitions of the curriculum. In this Handbook, we start from a working definition inspired by the work of Ronald Barnett and his colleagues (Barnett, 2000; Barnett & Coate, 2005; Barnett, Parry, & Coate, 2001). We define the curriculum as:

an intentional imagining and ordering of educational experiences that engages how students know, act, and are in the world.

Curriculum features

This broad definition points to a number of features that are particularly important when it comes to envisioning the curriculum in your own collaboration project:

- The curriculum consists of *educational experiences*.
- These educational experiences *engage* how students know, act, and are in the world.
- The curriculum *organizes* educational experiences.
- These educational experiences reflect our *choices* about that we think how students know, act, and be in the world.

Curriculum dimensions

Before envisioning the details of the specific experiences, students will engage with in your curriculum, it is important to look more closely at the three main dimensions of the curriculum: *knowing*, *acting*, and *being*.

KNOWING

What kinds of knowledge and what ways of knowing would you like your students to engage with in the curriculum? And how can we embed them in the curriculum?

Kinds of knowledge

Answering this question can help you think about how students should relate to, acquire, or produce knowledge in your curriculum. Conventional curricula, both in the natural and in the social sciences, have prioritized knowledge as the most important aspect of the curriculum. In particular, curricula in sciences from chemistry and biology to sociology and anthropology have usually aimed at fostering subject and disciplinary specialists.

ACTING

Which practical and professional skills would you like your students to develop in the curriculum? And how can we embed them in the curriculum?

Practical and professional skills

This question points to the skills and competencies that you would like students to acquire and develop through activities in your curriculum. From presentation skills to the skills in using digital technologies for communication and collaboration, we should think about the curriculum as involving the cultivation of different kinds of skills. The acting dimension has been traditionally the focus of technical curricula, such as nursing or engineering degrees.

BEING

What kind of mindset, attitudes, and sense of themselves in the world would you like students to cultivate? And how can we embed them in the curriculum?

Mindset and attitudes

The idea of being invites you to think about the curriculum as something more than knowledge and skills. Curricula deliver educational experiences that engage students in different dimensions, they foster ways for students to conceive of themselves as human beings in the world: attitudes and mindsets are developed by immersing them in a subject area. With the exception of humanistic education, the being dimension has rarely been the focus of curricula in higher education. However, this is changing, especially in sustainability education.

VIEWS OF KNOWING, ACTING, AND BEING

Barnett and Coate in *Engaging the Curriculum in Higher Education* (2005), as well as many other authors, have pointed out the importance of engaging the dimensions of knowing, acting, and being in the curriculum. For instance, Bloom et al. (1969) talk about cognitive, psychomotor, and affective domains to refer to the dimensions of knowledge, action, and being as learning outcomes. In the field of sustainability education, Sipos et al. (2008) frame “transformative sustainability learning” as aiming for the integration of learning processes taking place in

heads through understanding of unsustainability and sustainability, with *hands* enacting theoretical learning through practical skill development and physical activities, and with *hearts* that enable values and attitudes to be translated into behavior. With the specific goal of educating change agents for the 21st century, Rowe and Hiser (2016) argue for the importance of engaging with and developing skills, knowledge, and mindsets in sustainability education. Such reflections have led to important reforms at universities to accommodate transformative learning involving knowing, acting, and being dimensions (Brundiers & Wiek, 2011; König, 2015).

Background Box 5 Views of knowing, acting, and being.

1.2.2 Knowing, Acting, and Being in the Glocal Curriculum

Our glocal curriculum integrates the three dimensions of knowing, acting, and being while focusing on students and their learning experiences. In this way, students learn how to learn from each other and how to produce knowledge together about causes of and solutions to real-world sustainability problems across different geographical and cultural contexts. You can visualize these interconnections in the form of a triangle, whose sides are the different dimensions of the curriculum: knowing, acting, and being. Once you have envisioned the knowing, acting, and being dimensions of your curriculum, you can implement them in the process of curriculum design.

See Figure 5

See Part 2

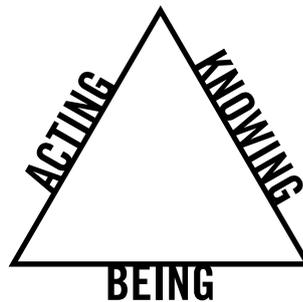


Figure 5 The three dimensions of knowing, acting, and being in the curriculum

In addition to insights and results from the Global Classroom project, we also make use of ideas and resources from research into higher education for sustainable development, which has extensively dealt with curriculum reform in higher education, as well as from the field of the internationalization of higher education, which has explored the institutional, curricular, and practical challenges of creating transnational collaboration for the education of global citizens in the 21st century.

INTEGRATING KNOWING, ACTING, AND BEING: A COMPETENCE-BASED CURRICULUM

A glocal curriculum is competence-based as it purposefully integrates and combines the dimensions of knowing, acting, and being in the educational experience that is offered to the students. We can define competence as: “complexes of knowledge, skills, and attitudes that enable successful task performance and problem solving” (Wiek, Withycombe, & Redman, 2011).

Definition of competencies

To develop any kind of competence, it is important to functionally link the dimensions of *knowing*, *acting*, and *being* in the curriculum. An education for change agents or for transformative learning has to engage students in all three dimensions when it comes to developing systems thinking or normative, collaborative, and other essential competencies for sustainability (Wiek et al., 2011).

A useful metaphor that helps us to think about the importance of integrating the three dimensions in the curriculum is to talk about a unity of *head* (knowing),

hands (acting), and *heart* (being) (Sipos et al., 2008). The *head* allows us to understand and produce knowledge. Yet it is our *hands* that make it possible to enact knowledge through practical skills and physical activities. Finally, our *heart* enables these mindset, values, and attitudes to be translated into behaviors.

Unity of head, hands, heart

KNOWING, ACTING, AND BEING IN THE GLOCAL CURRICULUM

The three dimensions of the curriculum represent a shift away from more traditional and conventional forms of education. We now highlight some of the general features that characterize this transformation into a glocal curriculum.

Shifts from conventional education

Knowing

From disciplinary-based knowledge to inter- and transdisciplinary engagement with knowledge:

Inter- and transdisciplinary

- Students tackle real-world problems by using multiple kinds of knowledge.
- Students critically recognize different kinds of knowledge and their relation to the problems at hand.
- Students situate different kinds of knowledge in relation to the cultural, social, and political circumstances in which they are produced.
- Students choose and make use of knowledge from different fields and disciplines depending on the specific real-world sustainability problems they are dealing with.

From acquiring and reproducing knowledge to engaging with existing knowledge and producing new knowledge for real-world problems:

Production and engagement

- Students engage in research and projects where they produce new knowledge about real-world problems and their solutions.
- Students actively adapt different kinds of knowledge to address real-world sustainability problems in different geographical and cultural contexts.
- Students deal with the uncertainty, risk, and possibility of failure in changing contexts over geographical space as well as over historical time.
- Students understand the importance of cultural, social, economic, and political contexts in the production of different kinds of knowledge.

DELIVERING KNOWLEDGE IN THE GLOCAL CURRICULUM

At the very beginning of the Global Classroom program, students and instructors discussed the sustainability of cities from many disciplinary perspectives. Together we studied findings and insights from current research undertaken by urban planners, historians, social scientists, natural scientists, as well as philosophers, activists, artists, and sustainability scientists. In a digitally facilitated environment, we learned together how to think sys-

temically about complex sustainability problems. In pre-recorded teaching videos, instructors presented material providing a specific perspective on urban sustainability, from city governance to envisioning methods and complex systems approaches to the understanding of urban environments. A diverse suite of texts, more videos, and web materials complemented the teaching videos. Students engaged the material in conceptual map exercises (see Global Classroom Example 3) and transatlantic presentations (see Global Classroom Example 2).

Global Classroom Example 1 Delivering knowledge while engaging knowing, acting, and being

Acting

- | | |
|----------------------|--|
| Collaboration | From the development of individual and competitive skills to collaborative and synergetic learning: <ul style="list-style-type: none">• Students actively collaborate with peers and instructors to understand and solve complex real-world problems.• Students learn how to collaborate across difference, whether national, cultural, social, or economic. |
| Transfer | From profession-specific skills to transferable competencies and a professional sense of responsibility: <ul style="list-style-type: none">• Students are challenged to develop professional profiles that do not necessarily fit into existing jobs but rather allow them to address and solve real-world sustainability problems.• Students develop skills for leadership, non-violent communication, and participatory decision-making to exercise civic responsibility.• Students make use of virtual and digital technologies to enhance communication as well as to foster collaboration among people from different cultural and geographical contexts. |

TRANSATLANTIC PRESENTATIONS THE GLOCAL CURRICULUM

In the Global Classroom, one ASU and one Leuphana student prepared together short presentations about the material presented in the teaching videos (see Global Classroom Example 1). They used Vidyo, Google Hangouts, or Adobe Connect. Each pair presented and discussed questions raised in the videos and reading materials. Using this format, students learned from one another about different ways of thinking about similar issues and situated these ways of thinking in

relation to different national and local contexts (knowing). For instance, while talking about urban governance, it became apparent there were significant differences between Germany and the USA. In the process of preparing and delivering a presentation together, students learned about respectful and nonviolent communication (being) as well as how to present ideas in a digitally facilitated environment (acting). Students also reflected on differences in the way they thought about the material and started situating themselves in relation to urban sustainability problems.

Global Classroom Example 2 Transatlantic presentations while engaging knowing, acting, and being

Being

From the periphery to the core of the curriculum:

- Students do not primarily focus on the development of professional and disciplinary identities.
- Students engage with normative and ethical questions connected to real-world sustainability problems in an unequal world.

Mindsets

From the development of disciplinary and/or professional identities to the empowerment and motivation of students to become change agents with the goal of transforming society:

- Students develop mindsets, attitudes, and a sense of themselves in the world that allows them to work across different contexts, capitalize on cultural diversity, and connect positively to different cultures.
- Students develop mindsets, attitudes, and a sense of themselves in the world that includes a commitment to creating solutions to real-world sustainability problems and the capability to produce systemic change.

Empowerment and motivation

CONCEPTUAL MAPS IN THE GLOCAL CURRICULUM

Thinking systemically means being able to connect different elements of and perspectives on complex issues. From the many teaching videos (see Global Classroom Example 1), students collected the most important questions related to urban sustainability. They then connected and compared the different questions in a conceptual map, charting their understanding of complex urban sustainability issues. They also compared their maps with each other and reflected on their similarities and differences. Through these conceptual mapping exercises, students learned to think about urban sustainability

problems by integrating different kinds of knowledge, reflected on how those kinds of knowledge differ, and on the difficulties of bringing them together (knowing). They also learned how to use conceptual map software freely available online and honed their skills in using virtual and digital technologies to communicate in different cultural and geographical contexts (acting). While comparing their maps with each other as well as by reflecting on their own conceptual maps, students became aware of the challenges and opportunities of working with other students from different cultures and learned how to develop a constructive and positive attitude towards cultural diversity (being).

Global Classroom Example 3 Conceptual maps of knowing, acting, and being.

1.2.3 How to Envision and Assess your Glocal Curriculum

The overall process of envisioning your glocal curriculum is divided in two main steps: Step 1 is about creating your vision, and Step 2 is about assessing your vision. The two steps are iterative. Once you have grounded your vision, you will have to adjust and re-craft it.

In the process of creating a vision of the glocal teaching-learning environment for your collaboration project, it is important for you to first think about your glocal curriculum and how you conceive of the three dimensions of acting knowing, and being—and their interrelationships. Assessing your vision will entail seeing if it is *integrated*, *student-centered*, *realistic*, and *shared* in the context of your collaboration.

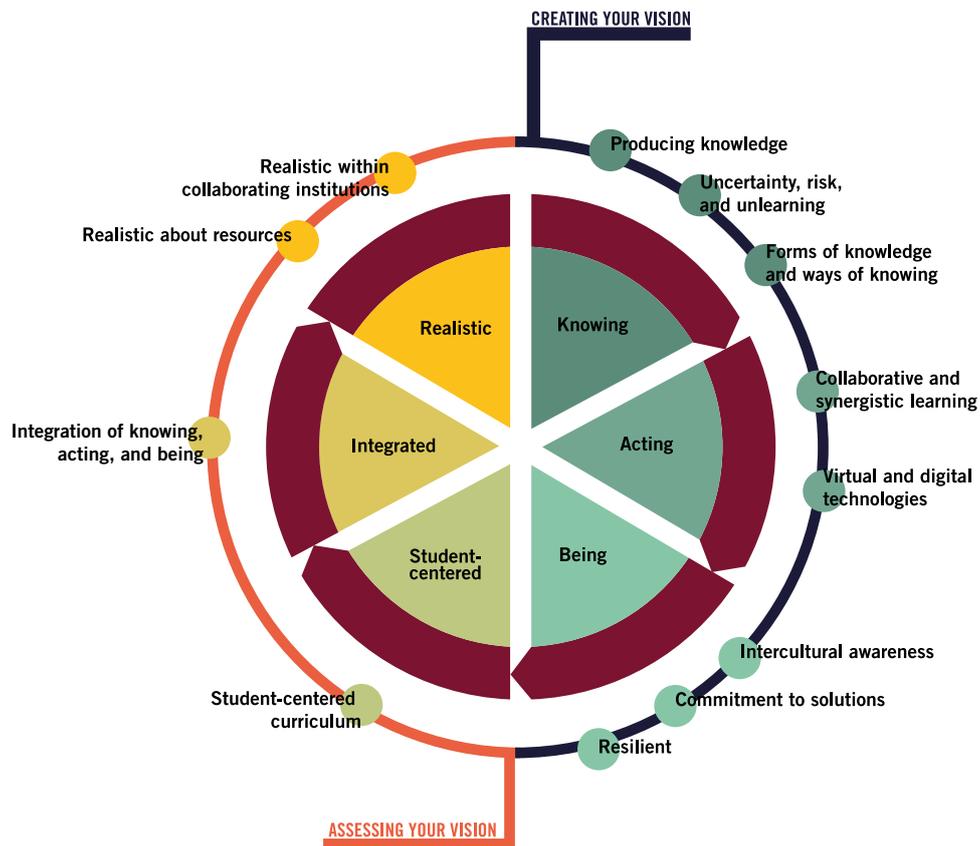


Figure 6 Overview: how to create and assess a vision for your curriculum

HOW TO CREATE YOUR VISION

In the initial more general stages of envisioning how you want to engage knowing, acting, and being in your glocal curriculum, it is useful to think about the main skills, kinds of knowledge, and mindsets that you aim to foster and why you want to foster them.

The worksheet below can help you think, or brainstorm, about the main goals of your curriculum.



WHAT?

WHY?

Knowing

What kinds of knowledge and what ways of knowing would you like your students to engage with in your curriculum?

Why are these kinds of knowledge important for students if they are to address real-world sustainability problems in local and global contexts in your scientific field?

Acting

What practical and professional skills would you like your students to engage with in your curriculum?

Why are these skills important for students if they are to address real-world sustainability problems in local and global contexts in your scientific field?

Being

What kind of mindset and sense of themselves in the world would you like your students to cultivate and develop in your curriculum?

Why are such mindsets important for students if they are to address real-world sustainability problems in local and global contexts in your scientific field?

You can use the following questions to further specify—or to stir up conversations about—how you address the dimensions of knowing, acting, and being in envisioning your glocal curriculum:

Knowing

- What kinds of knowledge will your students need to engage with in the curriculum? What kinds of knowledge do they need if they are to address the specific real-world sustainability problems they are interested in?
- What are the resources in your field that you can use to make sure students not only acquire and reproduce knowledge but also produce new knowledge for the understanding or solution of complex real-world sustainability problems?
- How can you facilitate the process of unlearning and actively adjusting knowledge, which is needed to understand and address real-world sustainability problems in different social, geographical, and cultural contexts? How will students learn to deal with the uncertainty and risk embedded in the process of understanding and addressing real-world sustainability problems in such changing contexts?

Acting

- How do you envision collaborative and synergetic learning in your transnational collaboration?
- How do you envision students learning to use virtual and digital technologies to enhance communication as well as to foster collaboration among people from different cultural and geographical contexts?

Being

- What kinds of mindsets, attitudes, and a sense of themselves in the world can help students work across different geographical and cultural contexts?
- What kinds of mindsets, attitudes, and a sense of themselves in the world foster a commitment to creating solutions to real-world sustainability problems and the capability to produce systemic change?

HOW TO ASSESS YOUR VISION

There are many factors that can guide processes of transnational and cross-border collaboration, e.g. from political to economic ones. Yet, it is very important to keep in mind the following questions to check that your curriculum is student-centered, integrated, realistic, and shared.



QUESTIONS

Student-centered

Are you thinking about the curriculum in a way that is student centered? Are you putting the development of skills and competencies for the student at the center of your project of curriculum reform?

Integrated

Are you thinking about the curriculum in a way that integrates knowing, acting, and being dimensions? Do you have a perspective on the curriculum that is holistic and integrated?

Realistic and shared

Is your vision of the curriculum realistic in the context of your institutional collaboration project? Do you have the right people who can support this vision? Do your transnational partners share this vision and can they contribute to its realization?

Worksheet 2 Questions about the main features of your curriculum

1.2.4 Further Reading

ON THE CONCEPT OF A CURRICULUM AS WELL AS ABOUT CURRICULA
BASED ON KNOWING, ACTING AND BEING

Barnett, R., & Coate, K. (2005). *Engaging the Curriculum in Higher Education*. *International Studies in Sociology of Education*. Berkshire: Open University Press.

Barnett, R. (2000). Supercomplexity and the Curriculum. *Studies in Higher Education*, 25 (3), 255–265.

ON COMPETENCIES IN SUSTAINABILITY EDUCATION

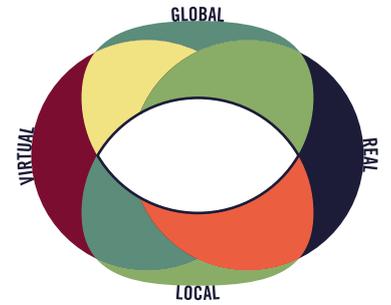
Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6(2), 203–218.

Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 8 (4), 416–430.

ON THE IMPORTANCE OF INTEGRATING KNOWING, ACTING, AND BEING
DIMENSIONS IN HIGHER EDUCATION FOR SUSTAINABILITY IN THE 21ST
CENTURY

Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving transformative sustainability learning: engaging head, hands and heart. *International Journal of Sustainability in Higher Education*, 9 (1), 68–86.

Rowe, D. (2007). Sustainability: Education for a Sustainable Future. *Science*, 317 (5836), 323–324.



1.3 ENVISIONING YOUR GLOCAL TEACHING-LEARNING ENVIRONMENT

A glocal curriculum can only be implemented in a glocal teaching-learning environment. In the same way in which we addressed the curriculum, here we provide a working definition of a teaching-learning environment that can help you in creating and assessing your glocal vision. Part 3 of the Handbook goes into a more detailed characterization of teaching-learning environments and provides resources and guidance about how to actually implement a glocal teaching-learning environment.

1.3.1 The Teaching-Learning Environment and its Dimensions

Every curriculum is put into action inside a teaching-learning environment, and much has been written about the environments in which teaching and learning take place. When we talk about teaching-learning environments, we are referring to:

all physical as well as all psychological, emotional, social, and cultural aspects that facilitate teaching and learning

The main dimensions of a teaching-learning environment are: direction, space, place, and people.

Who is the teaching-learning process directed towards? Who is at the center of the teaching-learning environment? This dimension refers to the *direction* of the teaching and learning process. It can be directed towards the learner or the instructor. The direction of the teaching-learning environment is its most fundamental feature and is essential for all other components of the environment.

Direction

What are the main physical features characterizing the teaching-learning environment? This dimension refers to the *physical space* where learning and teaching happens, including physical components such as infrastructure, tools, and materials. Traditionally this has been the classroom. However, teaching and learning activities are taking place more and more often in real spaces outside the classroom, which allow students to experience the local surroundings alongside virtual digitally enhanced spaces involving communication in different local contexts.

Space

How does the teaching-learning environment relate to local, national, and global socio-cultural contexts? The place dimension refers to the *social and cultural context* in which learning and teaching happen. Teaching and learning also take place with reference to institutional, local, national, and global contexts. Sometimes one context is privileged over others, but different contexts can also be balanced within a single teaching-learning environment.

Place

What kind of human relationships characterize the teaching-learning environment organizationally, emotionally, and psychologically? This dimension refers to the people involved in the teaching and learning process – whether students, instructors, administrators, or societal actors – and their psychological and emotional relationships.

People

Dimensions	The traditional teaching-learning environment
Direction	The direction is focused on the instructor's expertise.
Space	The space is constituted by the environment of the classroom, detached from the world outside.
Place	The place is an artificial one detached from the local context in which it is situated.
People	The relationship among people is mostly from the instructor to the students. All other relationships are not explicitly part of the learning experience.

Background Box 6 The teaching-learning environment in traditional education+

1.3.2 Reforming the Teaching-Learning Environment: Challenges and Goals

In the process of creating a vision for a glocal teaching-learning environment, it is important to ask two questions. Each question points to important sets of criteria. The first question is: How can a teaching-learning environment help connect the local with the global in the context of transnational collaboration? And the second question is: What kind of teaching-learning environment can enable the implementation of a glocal curriculum in the context of transnational collaboration? Each of these two questions voices specific challenges it is important to face when envisioning a glocal teaching-learning environment for your transnational collaboration project.

- Challenge 1** The first challenge is about connecting the local with the global. This connects to the first question about how a teaching-learning environment can help connect the local with the global points towards a first set of criteria, which is about:
- ensuring that the teaching-learning environment you are envisioning allows you to connect different local contexts on different levels, e.g. information, histories, values, ideas, attitudes, and mindsets.
 - ensuring that the exchange between the different local contexts is equitable and symmetric.
- Challenge 2** The second question addresses the second challenge of aligning the teaching-learning environment with the curriculum and asks what kind of teaching-learning environment can enable the implementation of a glocal curriculum in the context of transnational collaboration raises a second set of criteria, which is about:

- ensuring that your teaching-learning environment can actually support the implementation of your glocal curriculum.
- ensuring that your teaching-learning environment allows you to have students engage knowing, acting, and being in the ways you envision.

Subsequently, this addresses the appropriate support of joint learning and knowledge production across cultural and geographical contexts. Using the two sets of criteria above allows you to ensure:

Supporting joint learning

- that the interaction between and the engagement with local contexts leads to learning on both sides.
- that the interaction between and the engagement with local contexts leads to the joint production of knowledge.

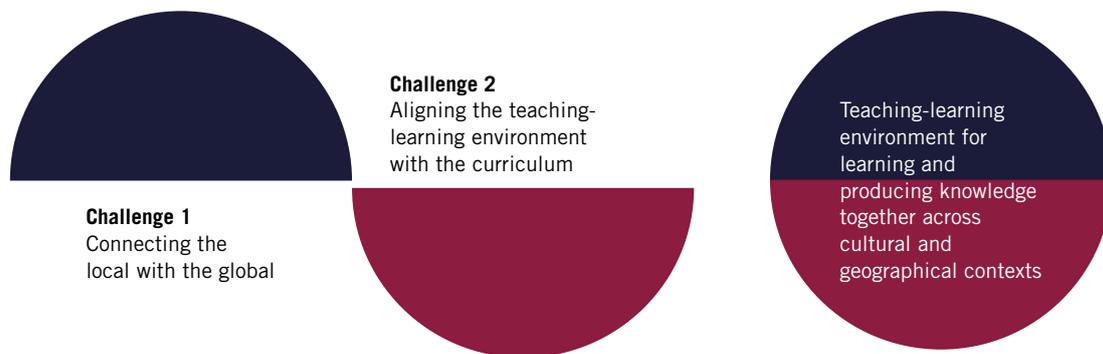


Figure 7 Challenges in envisioning a glocal teaching-learning environment

ADDRESSING CHALLENGE 1: ENGAGING GLOBAL AND LOCAL

Within the context of a transnational collaboration project, there are different degrees to which students can learn and produce knowledge about local contexts, from more experiential methods to those that include an active engagement with local communities. Another way to think about how students can connect with one another and their own local contexts on a global scale is to see different opportunities ranging from communication to collaboration.

See column 1 in Background Box 7

See column 2 in Background Box 7

Local actions

Perceiving

Experiencing

Exploring

Engaging

Global relationships

Connecting

Communicating

Sharing

Collaborating

Background Box 7 Ranges of local and global action

Experiencing, perceiving, exploring, and engaging locally

To develop competencies for understanding and solving problems in sustainability, students need to leave the classroom and their books to see, engage, and work in the real world. There are many different ways you can engage the local contexts and create spaces and places for learning in your environment. These range from more experience-based approaches to active engagement in sustainability projects.

See *Background Box 8*

ENGAGING LOCAL CONTEXTS

In recent years, research in different fields has pointed out how crucial it is that students also learn about sustainability in the real world outside classrooms and books. In higher education for sustainable development, important studies have argued for the importance of tearing down the walls separating the classroom from the real world (Brundiars, Wiek, & Redman,

2010). These works recommend a variety of approaches that include project-based learning (Brundiars & Wiek, 2013; Brundiars et al., 2010), service-learning (Jacoby, 1996) as well as different forms of internships (Linn et al., 2004). These works emphasize the importance of real experiences in local contexts to developing competences for change agents and transformative learning.

Background Box 8 Engaging local contexts

Engaging local contexts gives the different dimensions of the teaching-learning environment their own specific features:

- The place where teaching and learning happens is expanded to include local communities, businesses, and governments—each with its own distinguishing social and cultural features. **Expanded place**
- The space where teaching and learning takes place is not limited to the classroom but can include virtual and digital elements as well as physical areas outside the classroom, such as neighborhoods and communities adjacent to campus. **Unlimited space**
- And the relationships linking the people in the teaching-learning environment are many and varied, and include students, instructors, people from the local communities, as well as other stakeholders. **Varied relationships**

Connecting, sharing, communicating, and collaborating globally

Whereas more traditional forms of collaboration make use of student mobility to promote learning and joint knowledge production across different contexts, new technologies open up new spaces that can complement the use of mobility in the development of glocal teaching-learning environments.

Virtual tools and technologies allow networks of students and scholars living and working in different local contexts and yet interested in similar issues to communicate and collaborate. The use of virtual technologies and virtual spaces allows new spaces to be created for collaboration, mutual learning, and the production of knowledge among students and instructors from different cultures.

Virtual and digital technology

A glocal teaching-learning environment makes use of virtual and digital technologies to

- encourage informal ways for both instructors and students to get to know one another by sharing their own stories, values, and perceptions across different local contexts.
- support communication, collaboration, and the joint production of knowledge in activities in the world outside of the classroom across different local contexts

Global Classroom Example 4 shows also shows examples of how the use of experience and research-based methods as well as of digital and virtual technologies made it possible to share and collaborate on a global scale in the Global Classroom project. The two examples also show how these activities are aligned with the curriculum.

See Global Classroom Example 4

Although transnational collaboration offers an obvious opportunity to engage with cultural, social, and economic diversity, it is important to keep in mind that domestic contexts also present the opportunity to develop intercultural competencies by immersing students in real-world settings. Domestic learning environments extend beyond the home campus and formal learning to include the diversity found in local communities.

	Experienced-based learning in the Global Classroom	Research-based learning in the Global Classroom
Local scale	<p>Experiencing local contexts</p> <p>In our Global Classroom, we created an experience-based learning framework that allowed students from Phoenix and Tempe in Arizona together with students from Hamburg and Lüneburg in Germany to experience and explore their local environment through a sustainability lens. We used conceptual mapping and walking methods to provide a bottom-up, student-centered entry point for the development of sustainability competencies (Caniglia et al., 2016).</p>	<p>Engaging local contexts</p> <p>In our Global Classroom, students also worked on place-based research projects in teams. Examples include the dynamics of retrofitting urban areas, community gardens in disadvantaged communities, and local urban food systems in different cultures and geographical contexts. Students engaged with the local contexts of their cities using different methods ranging from transdisciplinary approaches involving the local communities and stakeholders to more traditional approaches from the social and natural sciences, as well as the humanities.</p>
Global scale	<p>Communicating and sharing globally</p> <p>Students performed mapping and walking activities in their own local contexts. Afterwards, they presented the results in a video-conference setting, where they discussed and compared the results of their activities on both sides of the Atlantic (Caniglia et al., 2016).</p>	<p>Collaborating and sharing globally</p> <p>Though place-based, the research projects were designed and carried out in international teams. Each team comprised students from both Leuphana and Arizona State. Mentored by one or more instructors, students from both sides of the Atlantic met regularly in their teams using digital and virtual technologies. They also presented and discussed on a regular basis the progress of their work and their results in plenary sessions facilitated through video conferences.</p>

Global Classroom Example 4 Experience- and research-based learning

JUST AND EQUITABLE TRANSNATIONAL COLLABORATION

**Balanced, equitable,
symmetric**

One of the major challenges with connecting different local contexts and engaging processes of learning and knowledge production is the possible asymmetries and inequalities that might accompany such a connection. This makes it especially important to carefully plan your teaching-learning environment so that it ensures that the relationships among students in the different local contexts of your transnational collaboration are set up in a way that promotes equitable and symmetric interactions in processes of learning and knowledge production. When thinking about the physical infrastructure of the teaching-learning environment, it is important that the tools and equipment used by the partners in the collaboration project allow for the communication and exchange of ideas in a way that doesn't put one or the other partner in a position of advantage or disadvantage.

Similarly, when thinking about the local contexts of the teaching-learning environment (place), it is important to think early on about having students engage such contexts in ways that are comparable. This aspect is even more important when envisioning how instructors, students, and others in the teaching-learning environment will work together (people), whether in the instructors' team or in the ways students interact with each other in the same local context or across different local contexts.

ADDRESSING CHALLENGE 2: ALIGNING CURRICULUM AND THE TEACHING-LEARNING ENVIRONMENT

The second challenge points out the importance of aligning the teaching-learning environment in your transnational collaboration project with your *glocal* curriculum. There cannot be one without the other. This seems to be an obvious requirement for setting up a teaching-learning environment, but given the complexities and challenges in organizing transnational collaboration, it is important to already think about how to align curriculum and teaching-learning environment in the process of creating a vision.

Global Classroom Example 5 illustrates how to think about aligning the curriculum with the teaching-learning environment. For instance, when you think about how to make use of virtual technologies you must align this with the learning activities you are planning so students are able to develop the mindsets, attitudes, and a sense of themselves in the world that would help them to work across different contexts, capitalize on cultural diversity, and connect positively to other cultures (being). It is also important to think about the physical, socio-cultural, and human characteristics (space, place, and people) that will support students in learning how to use virtual and digital technologies to enhance intercultural communication as well as to foster collaboration among people from different cultural and geographical contexts (acting). But it is also important how you conceive of the cultural and social dimensions in the environment of your transnational collaboration project so as to allow for research projects where students produce new knowledge about real-world sustainability problems and their solutions or how they can deal with uncertainty, risk, and the possibility of failure in changing contexts over geographical space (knowing).

**See Global Classroom
Example 5**

It is important to take into account the process of aligning the teaching-learning environment with the curriculum as it also has implications for how we think about managerial and teaching responsibilities and how we assign roles. Global Classroom Example 4 gives you an idea of how we managed to combine these two aspects in our Global Classroom.

EXPERIENCE-BASED ENVIRONMENTS AND THE CURRICULUM

In experience-based learning activities in the Global Classroom (See Column 1 in Global Classroom Example 4), instructors facilitated the experiential and exploratory activities undertaken by small teams of students (people). Students then presented and discussed their results both in plenary settings using video conferencing tools and in smaller groups using for instance Adobe Connect (space). This allowed students to learn about each other's local contexts and their sustainability challenges together with possible solutions to those challenges (knowing). Students were also introduced to communication using digital technology in international and intercultural environments (acting) with the help and feedback of both instructors and other students (people). Finally, they critically situated themselves with their own social and cultural backgrounds in relation to the sustainability challenges they were addressing (being).

RESEARCH-BASED ENVIRONMENTS AND THE CURRICULUM

In research-based approaches in the Global Classroom (See Column 2 in Global Classroom Example 4), small groups of students and instructors (people) held regular transatlantic virtual meetings (space) where they planned and organized their research activities. These meetings allowed students not only to learn about each other's local contexts but also to jointly produce knowledge about those contexts as well as about the sustainability challenges found in them and possible solutions to those challenges (knowing). Students did this by actively engaging and researching sustainability problems and solutions in local contexts (place). They also improved their skills in communicating through the use of digital technology (space) in international and intercultural environments (acting). Finally, they critically situated themselves with their own social and cultural background in relation to the sustainability challenges addressed in their research projects (being).

Global Classroom Example 5 Aligning the curriculum and the teaching-learning environment

1.3.3 Institutional and Organizational Issues: Creating Realistic Visions

Institution and administration

A final issue in creating a vision for your glocal teaching-learning environment is to keep in mind the institutional context of your transnational collaboration. Transnational collaboration on this scale requires institutional support to be realistic and ultimately sustainable. The collaborating partner institutions provide the support structure for the project. The contexts will be different in each project, and it is hard to generalize, but we can offer a number of questions that will be helpful in understanding your own institutional context:

- How does your transnational collaboration project fit into your institution? How does it fit into your institution's overall curriculum?
- Will your institution be able to provide adequate support to all of the parties involved? What can you do to create a vision that is realistic given the resources provided by these institutions? What kind of resources, both technical and human, does your institution have that can support your efforts?
- Are your expectations for students and for instructors realistic? Will both students and instructors be expected to invest roughly the same amount of time in the project? Is it possible to recognize instructors' commitment in the collaboration by reducing their teaching load in other courses?

Is your institution flexible enough to accommodate the unique features of a global curriculum (e.g. collaborative or experiential activities) and teaching-learning environment (e.g. virtual technologies for communication and the involvement of instructors in different roles)?

Addressing these questions in the context of each new collaboration project will help you to ground your vision in institutional realities and ultimately enable you to succeed in the implementation of your vision.

AN ORGANIGRAM FOR YOUR TRANSNATIONAL COLLABORATION

Managing a global curriculum in a global teaching learning environment in your transnational collaboration will also require important changes in how you conceive of and envision the roles and responsibilities of the people involved. One of the main challenges is to consider this three-fold role of teaching and managing and coordinating the collaboration. All three elements are important to make your vision realistic.

Vision for roles and responsibilities

The organigram shows the different roles and responsibilities of the team in our Global Classroom. Here, we give you some suggestions that might be helpful to you when creating and assessing a realistic vision for your own collaboration project. We suggest thinking about four main roles and responsibilities: leaders, instructors, integrators/coordinators, technicians and teaching assistants.

See Figure 8

Leaders are those (usually professors) in charge of the overall transnational collaboration who have central responsibilities in the overall organization and structure of the curriculum and teaching-learning environment.

Leaders

- Teaching role and responsibilities: The leaders work closely with integrators and coordinators (see below) and are usually present in class during the different activities.
- Organizational responsibilities: The leaders contribute to creating the overall vision and work in close collaboration with the integrators both in organizing in-class activities and in coordinating the team of instructors.

Experts are those people involved in the project because of their expertise in a certain area, topic, or discipline.

Experts

- Teaching role and responsibilities: Experts are only present in class for specific activities. They facilitate the learning and knowledge production processes of the students. Experts provide the students with specific perspectives on a certain topic. For instance, in the case of urban sustainability, experts in ecology can talk about ecosystem services in cities, and historians can about the historical development of urban settlements. They can come from academia but also from practice. Experts can be instructors or in charge of coaching the students in specific research projects and assure the quality of their research process and outcomes.
- Organizational responsibilities: In the process of developing the curriculum, experts can provide formative feedback and share their experiences or help improve the overall program in meetings where the overall organization as well as the evaluation of the overall global curriculum and teaching-learning environment is assessed.

Integrators and coordinators

Integrators/coordinators are those people who are always present in class working with the students and who coordinate the overall activities of the collaboration. At least one integrator/coordinator is needed in each of the partner institutions. The role of the integrator/coordinator is an innovative role that emerged from the experience of the Global Classroom.

- **Teaching role and responsibilities:** As integrators these instructors work with the students on bringing together (integrating) different disciplinary perspectives on a topic (e.g. urban sustainability) usually presented to the students by the experts. They moderate and facilitate interdisciplinary processes. Integrators can also be in charge of specific activities and work closely with the students, handling team dynamics and intercultural competence when students work together in transnational teams.
- **Organizational responsibilities:** As coordinators these instructors have a clear overview of the curriculum and of how the teaching-learning environment works. They coordinate the activities in the curriculum as well as the way experts interact and work together with the students, ensuring that all necessary learning outcomes are met. Most importantly, the integrators coordinate between the different academic systems—for instance the academic calendars—of the partner institutions in the transnational collaboration. They should hold weekly virtual meetings to plan activities.

Technicians and teaching assistants

Technicians and teaching assistants are those people who make sure that the implementation of the curriculum and teaching learning environment runs smoothly on a daily basis thanks to their technical expertise.

- **Teaching role and responsibilities:** Technicians and teaching assistants work closely with and support the work of the integrators. They manage the virtual environment (e.g. technical equipment) and help in all classroom activities.
- **Organizational responsibilities:** The teaching assistants take part in organizational meetings with the integrators and help implement decisions made in the meetings.

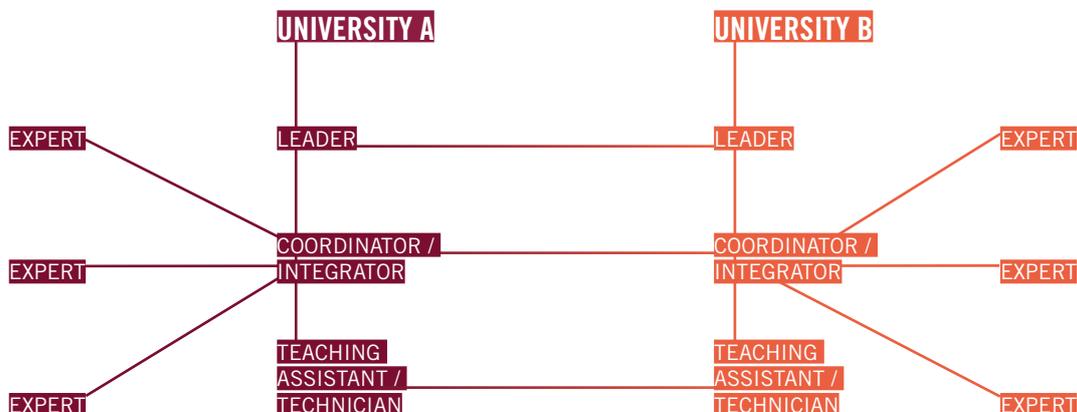


Figure 8 Organigram of a global teaching-learning environment

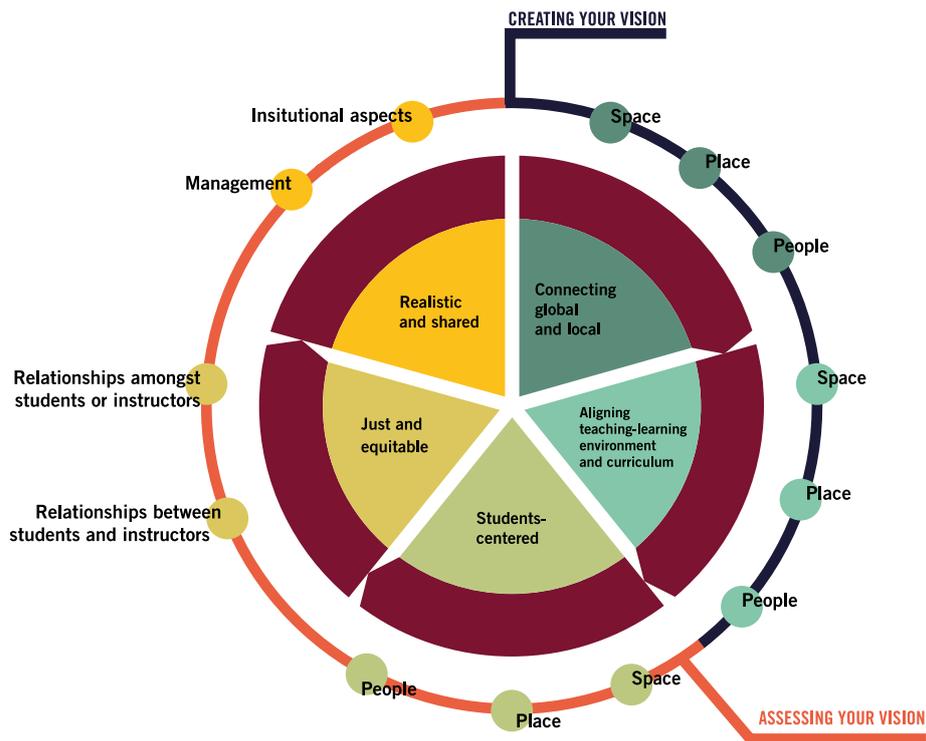


Figure 9 Overview: how to envision and asses your glocal teaching-learning environment

1.3.4 How to Envision your Glocal Teaching-Learning Environment

You can divide the process of envisioning a glocal teaching-learning environment in two main steps: Step 1 is about creating your vision and Step 2 is about assessing it. The two steps, like in the process of the curriculum, are iterative. Once you have grounded your vision, you will most probably have to adjust and modify it.

In the process of creating a vision of the glocal teaching-learning environment for your transnational collaboration, you can start by thinking about the space, place, and people that characterize it. In this process, it is important to pay attention to how you address questions about, first, connecting local and global (Challenge 1) and, second, aligning the teaching-learning environment to the curriculum (Challenge 2).

See Figure 9

Assessing your vision will entail ensuring that your vision is student-centered, equitable and just, and realistic and shared. This will allow you to have a vision that opens spaces for students to develop the knowledge, skills, and mindsets needed for joint learning and joint knowledge production across geographical and cultural contexts.

1 CREATING YOUR VISION: CONNECTING GLOBAL AND LOCAL

The questions in Worksheet 3 below will help you make sure that you envision space, place, and people in your teaching-learning environment so as to allow for local experiences, explorations, and engagement as well as for global communication, collaboration, and sharing (Challenge 1). The questions allow you to craft a vision that is realistic and at the same time desirable.



QUESTIONS

Space

- What would be the best way to organize space (tools, materials, and infrastructure) between partner universities in your teaching-learning environment?
- How does your vision of space allow you to integrate and connect local and global dimensions?

Place

- What would be the best way to engage the different socio-cultural contexts provided by your institution and your partner's?
- How does this vision of place in your teaching-learning environment allow for the connection and integration of local and global dimensions?

People

- What would be the best way to think about the relationships among students as well as between students and instructors characterizing your teaching-learning environment?
- How does this vision of people and their relationships in your teaching-learning environment allow for the connection and integration of local and global dimensions??

Bringing together space, place, and people

- Overall, how does your teaching-learning environment allow for integration and connection of the local and global?
-

Creating your vision: aligning the teaching-learning environment with the curriculum along the different dimensions

Worksheet 4 below should help you think about how the teaching-learning environment is aligned with the curriculum (Challenge 2). When developing your vision of a glocal teaching-learning environment you should align the dimensions of space, place, and people with the curriculum and its main goals. You can collect in the worksheet below your ideas about how the different dimensions of your teaching-learning environment support your curriculum.

Curriculum	HOW WOULD YOU ALIGN YOUR TEACHING-LEARNING ENVIRONMENT WITH YOUR CURRICULUM?	Teaching-learning environment
Knowing, acting, and being	1. 2. 3. 4. 5. 	Space, place, and people

Worksheet 4 Supporting your curriculum with your teaching-learning environment

2 ASSESSING YOUR VISION

Once you have a vision of the main dimensions of your teaching-learning environment, you can use the following questions to check that your glocal teaching-learning environment is student-centered, equitable and just, realistic and shared.



QUESTIONS

Student-centered

- Do space, place, and people in the environment support student development of the necessary skills and competencies?
- How exactly is this accomplished in keeping with your vision?

Just and equitable

- What are the spaces, places, and people in the environment that support just and equitable exchanges among students, among instructors as well as between students and instructors?
- How exactly is this accomplished in keeping with your vision?

Realistic and shared

- Is this vision coherent with the values of your transnational partner institutions?
- Is this vision of the teaching-learning environment realistic in the context of your project?
- Do you have the right people who can support this vision?
- Does everyone agree on the vision and are they ready to commit to its implementation?

Worksheet 5 Assessment questions for the vision of a glocal teaching-learning environment

1.3.5 Further Reading

ON THE ENGAGEMENT OF LOCAL CONTEXTS IN SUSTAINABILITY EDUCATION

Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: from classroom into the real world. *International Journal of Sustainability in Higher Education*, 11 (4), 308–324.

Scholz, R. W., Lang, D. J., Wiek, A., Walter, A. I., & Stauffacher, M. (2006). Transdisciplinary case studies as a means of sustainability learning: Historical framework and theory. *International Journal of Sustainability in Higher Education*, 7 (3), 226–251.

ON CHALLENGES AND STRATEGIES OF THINKING ABOUT THE CURRICULUM FROM LOCAL AND REGIONAL TO NATIONAL AND GLOBAL

Leask, Betty. Bridging the gap: Internationalizing university curricula. *Journal of Studies in International Education* 5.2 (2001): 100-115.

Leask, B. (2012). *Internationalisation of the curriculum (IoC) in action: A Guide*. Sydney.

Jones, E., Coelen, R., Beelen, J., & Wit, H. de (Eds.). (2016). *Global and Local Internationalization*. Rotterdam: SensePublishers.

1.4 CONCLUSIONS

Resources and reflections for envisioning

Part 1 has presented, resources, examples, and critical reflections that can help you create and assess a vision for your transnational collaboration project. It will be important that your vision accounts both for the dimensions of knowing, acting, and being in the curriculum and for place, space, and people in the teaching-learning environment.

Envisioning as iterative process

The process of crafting and assessing the vision of your curriculum will be highly iterative. After creating a first vision of your curriculum you will most likely have to go back to the vision and make changes. The process will also be participative as many people from the institutions involved in the collaboration project—whether instructors, administrators, staff members or others—will be part of this process. Some general criteria apply to assessing both your vision of a glocal curriculum and its teaching learning-environment. For instance, a successful implementation requires that both should be realistic and shared.

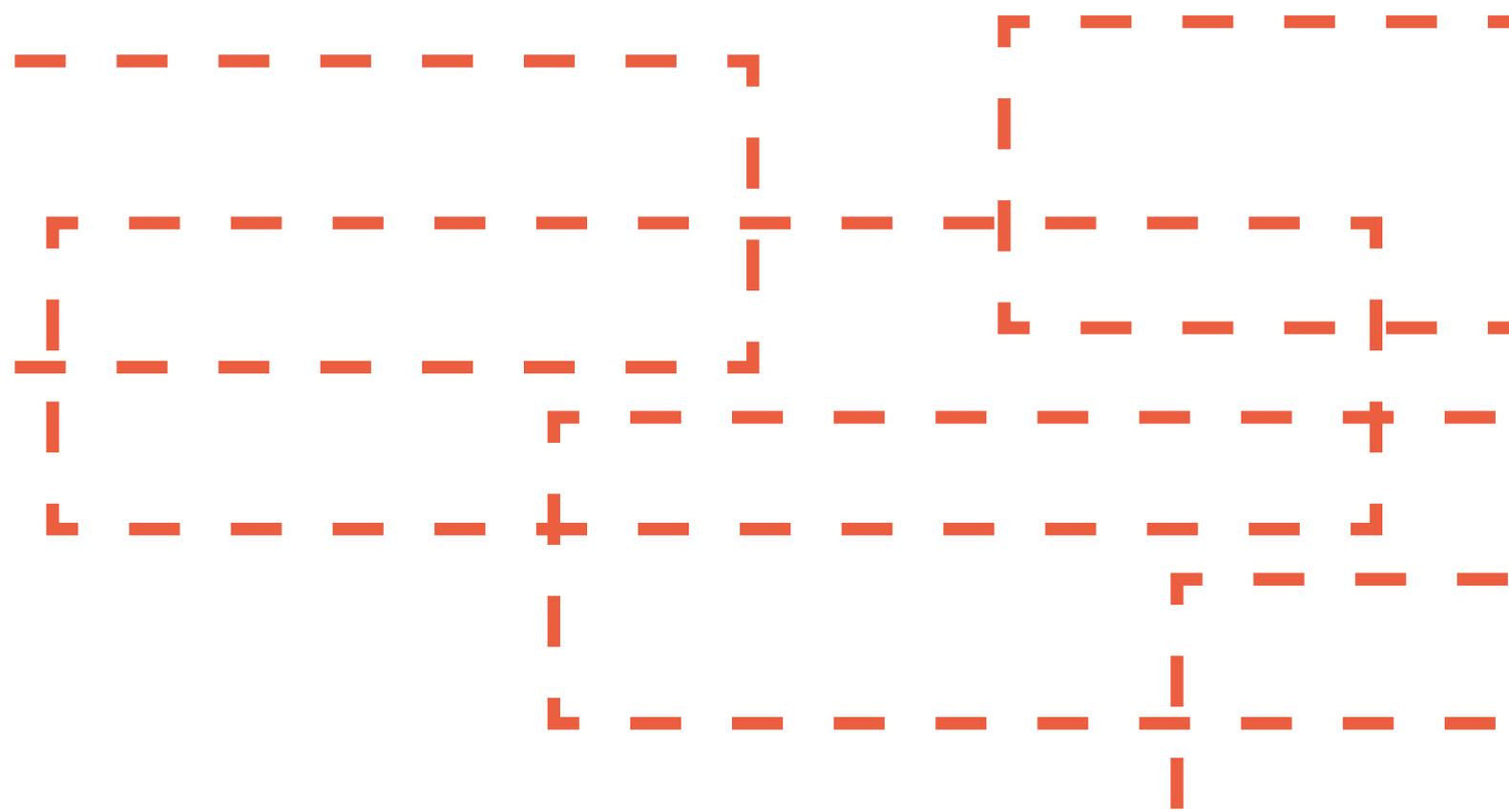
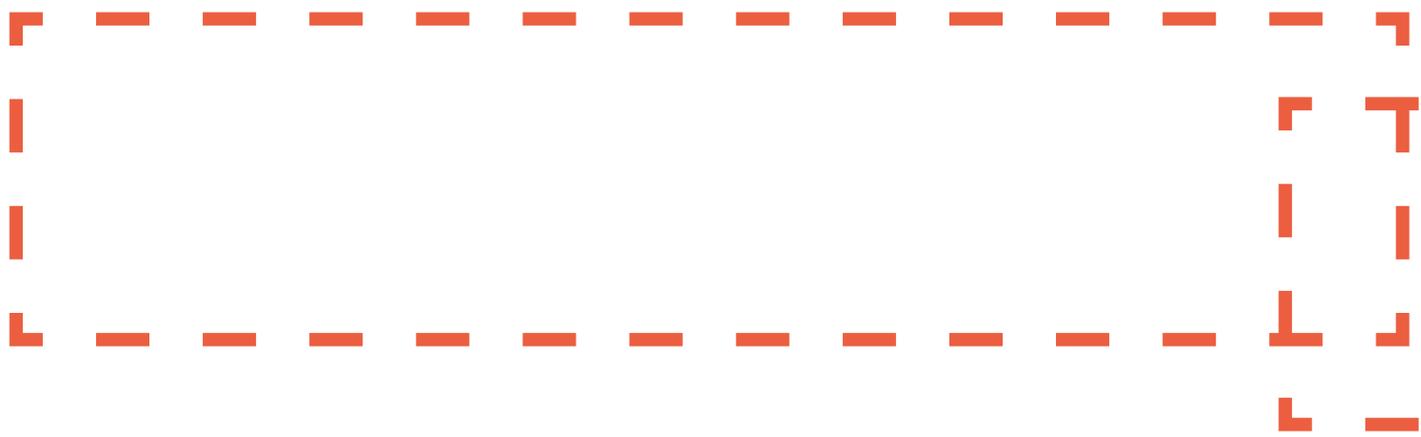
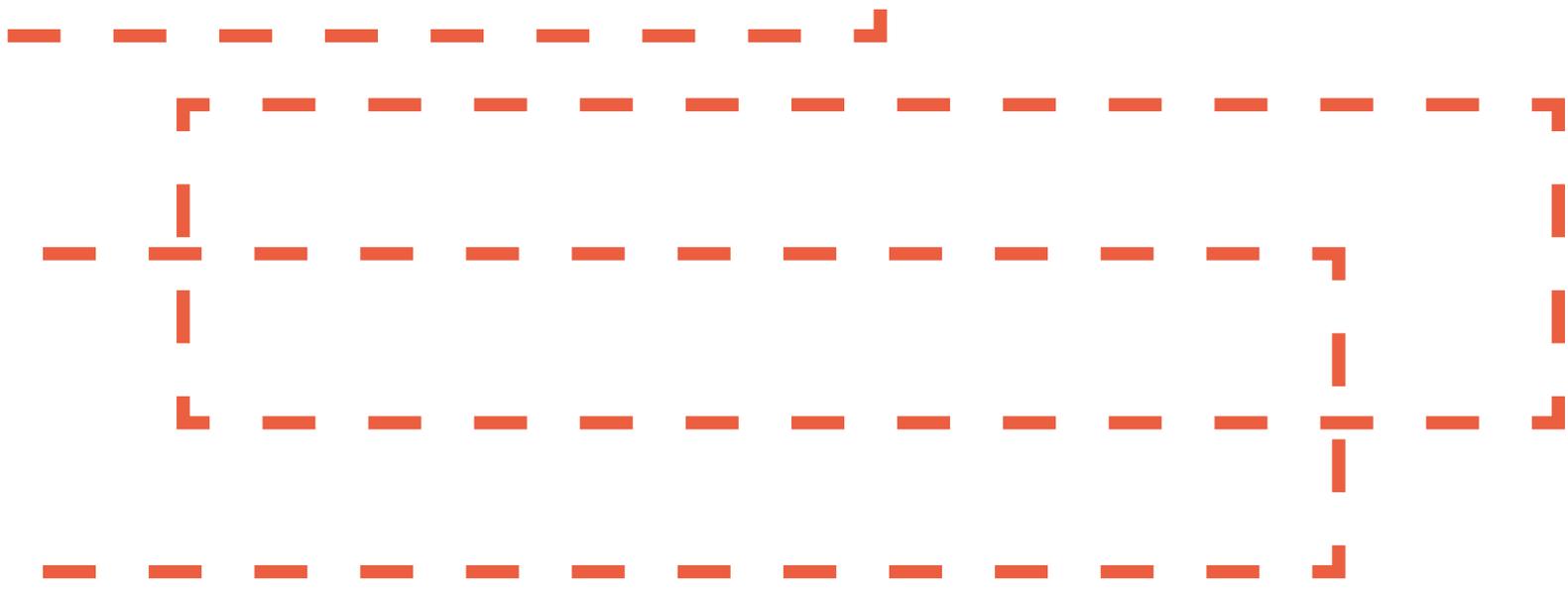
Envisioning as participative process

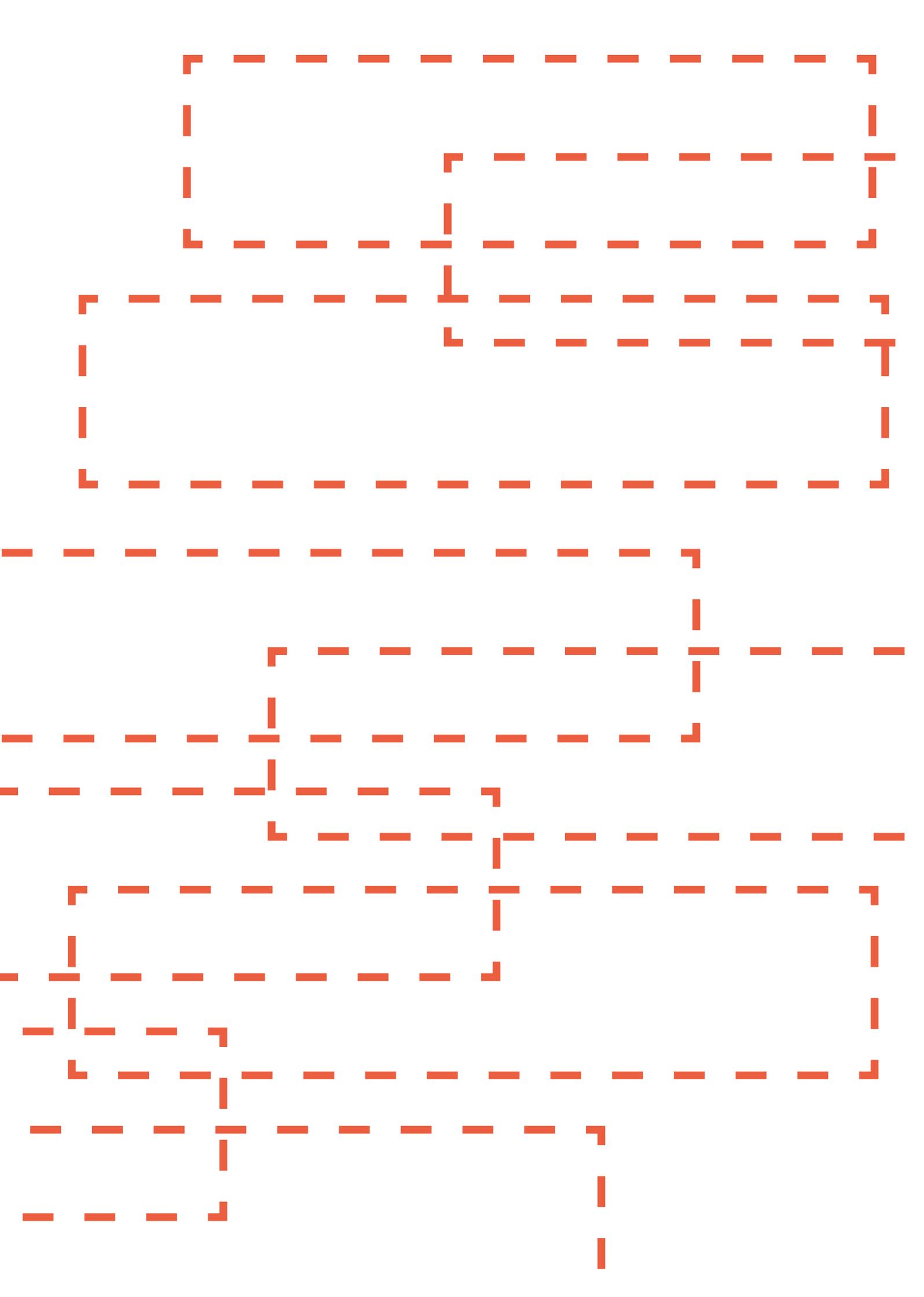
Realistic and shared vision

With a realistic and shared vision, you will be better able to understand the obstacles that are actually in the way to its implementation as well as what it will take for you to overcome them and achieve that vision. It will be very important that your vision is shared if the process of designing and implementing both the curriculum and the teaching-learning environment is to be successful.

See Part 2
See Part 3

1





PART 2 - DESIGNING GLOCAL CURRICULA AND PROGRAMS

The vision of a glocal curriculum that engages real-world issues will hopefully attract highly engaged and interested students and instructors. But how do we deliver on what we promise? How do we turn the vision into an educational experience that truly offers the learning and change-making opportunities the participants desire? This is not an easy task, as this kind of teaching-learning goes against the grain of most institutional structures (Huber & Hutchings, 2004). But it can and does happen at the intersection of thoughtful design and thorough planning, which Part 2 will support you in doing, and the flexible, creative, as-you-go contributions of everyone over the course of the program.

Curriculum design: why, what and how

The curriculum can be understood as the “why” this type of education is important, the “what” can be learned in it, and the “how” this learning is facilitated through teaching-learning opportunities, as well as how it is evaluated. Part 1 of this Handbook provided you with ideas and resources to envision a glocal curriculum in the context of transnational collaboration. Part 2 now moves on to help you translate a vision into a redesigned curriculum. It addresses the “why”, the “what”, and the “how” on the levels of curriculum design and program of study (evaluation and assessment will be addressed in Part 3 of this handbook). Our use of curriculum refers to our experiences with the Global Classroom project, a sustainability minor open to undergraduates from all disciplines. This format is particularly attractive since it allows a wider range of students to experience a glocal curriculum, not only those who already committed to a major in sustainability. However, the model curriculum we offer here is intended to be scaleable to different formats from a single course to a full major program of study.

DEFINITIONS: CURRICULUM, PROGRAM, AND SYLLABUS

As presented in Part I of this Handbook, the **curriculum** is an intentional imagining and ordering of educational experiences that engages how students know, act, and are in the world. In this sense, curriculum includes “why” this education is important (the educational goals), “what” can be learned (the intended learning outcomes), and “how” this learning is facilitated (teaching concepts and how learning is evaluated). It also outlines the sequence of learning over time, and how learning is built through subsequent levels of complexity.

Program specifies the actual courses that can or need to be taken to fulfill the curriculum requirements. It further structures the course sequence. The program should be aligned with the educational goals and intended learning outcomes of the curriculum.

Syllabus refers to the description of a specific course, and defines its intended learning outcomes. It also includes descriptions of what the participants will do—activities and assignments—and how they will be evaluated. The syllabus should directly relate to and support student development towards the educational goals and intended learning outcomes of the curriculum and program.

Background Box 9 Definitions: curriculum, program, and syllabus.

There are two main challenges in actually designing a glocal curriculum:

2 challenges of design

- First, there is a huge variety of approaches in higher education for sustainable development (HESD) to the “what” (topics, key competencies, knowledge, skills, and attitudes) and the “how” (transformative teaching-learning concepts). What guides our choices, and how do we choose well so that we can actually meet the goals of a re-envisioned curriculum?
- Second, conventional curriculum and program structures are not designed to cover such a broad range of competencies or include transformative teaching concepts; they are usually designed to cover disciplinary knowledge and related professional skills. How do we implement the much broader educational goals of a glocal curriculum without leaving significant gaps in the actual learning opportunities?

For a glocal program, these challenges are multiplied: curriculum designers and participating instructors will need to engage the curriculum across different academic systems, each with their own institutional cultures and requirements, each of which is embedded in different national and local cultures and perspectives. This requires processes of negotiation on both the content and the organizational level: the approaches to “what” should be learned in the new curriculum will most likely differ, depending on a university’s and department’s histories, philosophies, and current research directions. These differences need to be explored openly so as to avoid basing the collaboration on implicit assumptions that may not actually be shared. Similarly, ideas about transformative teaching concepts and environments need to be discussed: for example, how is in-classroom vs. out-of-classroom learning or teacher-centered vs. student-centered learning regarded by the participating universities and in their national teaching-learning traditions? Differences can also be synergies. As instructors and possibly resources are shared between the universities, it becomes easier to cover the broad range of kinds of knowledge, skills, and learning opportunities needed. On an organizational level, local opportunities and resources for implementing such a glocal curriculum may differ. For example, project and research-based learning, particularly in international groups, requires more teaching hours than a conventional class. What is possible for both sides so that the new program doesn’t break the local faculty’s teaching budgets?

Combination of two academic systems

Differences, negotiations, and synergies

To address these challenges in designing a glocal curriculum for change agents in the 21st century, the model curriculum we offer in this Handbook is structured in a particular way: first, through the curriculum dimensions of knowing, acting, and being, which help you to develop your curriculum vision and, second, through five learning areas that represent fields of expertise in which change agents need to build competencies. This structure is designed to help you choose in a structured manner “what” needs to be part of your curriculum; for example which topics, competencies, and skills. Similarly, it helps to consciously choose “how” these competencies can be built; for example by deciding on which transformative teaching concepts and environments you will use. Because of the wide range of competencies and skills in the glocal curriculum, gaps between intended learning outcomes, curriculum design, and actual learning opportunities occur easily. The combination of curriculum dimensions and learning areas in the model curriculum is therefore also designed to help make these gaps visible and close them during the planning process. This finds further application in program design.

See Section 2.2.2

See Section 2.2.3

See Section 2.2.4
See Section 2.3



The following section provides an overview of the learning areas. Then step by step, we present the design elements of a curriculum based on our model, with key questions and worksheets for you to design a curriculum that fits your particular context.

2.1 LEARNING AREAS FOR A GLOCAL CURRICULUM

See Figure 4 in Part 1

The glocal curriculum visualizes the dimensions that frame and are part of all learning—knowing, acting, and being—as three sides of a triangle. Within this frame, we find five distinct areas of learning are necessary for building the full set of change agent competencies; these are represented as the lines within the triangle.

- | | |
|----------------|---|
| Learning areas | <ol style="list-style-type: none"> 1. Subject learning enables students to engage existing kinds of knowledge about the topics in the curriculum as critical and transformative thinkers. 2. Research learning enables students to produce actionable knowledge on real-world issues. 3. Collaborative learning enables students to work together with others in a variety of settings, both as participants and as facilitators. 4. Professional learning enables students to successfully participate in a wide range of today's local and virtual work environments 5. Personal learning enables students to develop as reflective and active citizens. |
|----------------|---|

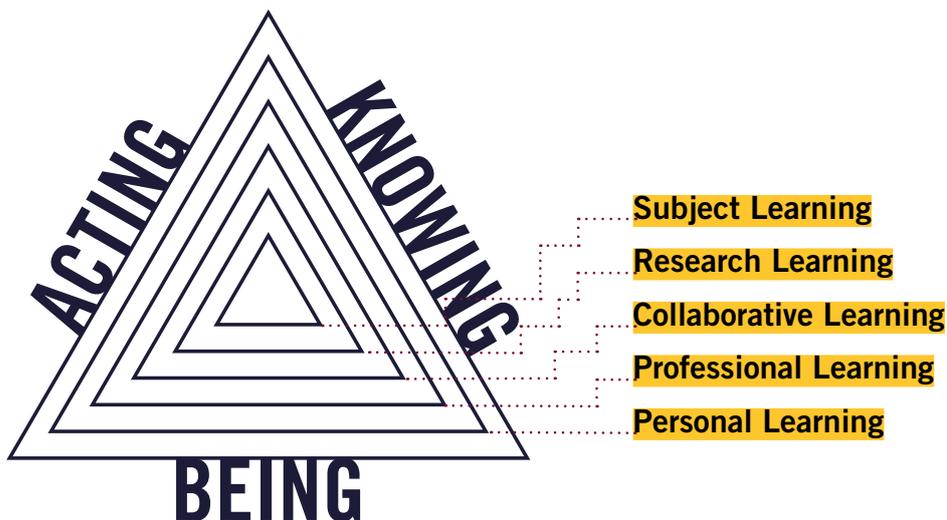


Figure 10 Curriculum dimensions and learning areas

2.1.1 Reasons and Contents of Learning Areas

In the following, you will find a brief description of why each learning area is important and what it is about.

1) SUBJECT LEARNING: ENGAGING KINDS OF KNOWLEDGE

Background: Sustainability problems cross disciplinary borders and extend beyond academically produced knowledge (Lang et al., 2012). They require people who can do so as well, people who can engage with and synthesize different kinds of knowledge to understand these complex problems and create solution options. This requires new ways of dealing with information, critically contextualizing and selecting it, dealing with ambiguity, complexity, and epistemic pluralism.

Content: Therefore, instead of focusing on one disciplinary subject, the content of this curriculum is a problem-based approach to sustainability that draws on different kinds of knowledge as needed (Hmelo-Silver, 2004). Problem-based learning doesn't mean focusing solely on problem understanding, but contextualizes such analysis within a solution-oriented process (Brundiers & Wiek, 2013). It doesn't necessarily replace disciplinary specialization, (in our Global Classroom, students were majoring in a number of different disciplines). Rather, it shows such expertise to be one of several contributing elements needed to solve sustainability problems, and prepares students to become catalysts and moderators in interdisciplinary environments (Bammer, 2013).

Interdisciplinary
perspectives

Examples: Students engage with materials from different disciplines and contexts you choose, they engage with information they research and evaluate themselves, and they may also tap into personal kinds of knowledge, like their perceptions and knowledge of their own city.

Meta-level learning: Students learn about different kinds of knowledge and how to recognize and engage them appropriately for the task at hand. They learn about interdisciplinarity and how to use both disciplinary and interdisciplinary methods appropriate to the task.

Glocal learning: The curriculum actively engages different kinds of knowledge and fosters learning to situate them historically, culturally, and politically. Transnational collaboration provides concrete learning opportunities for students to understand kinds of knowledge in their specificity, and compare and connect them in meaningful ways.

2) RESEARCH LEARNING: ENGAGING THE WORLD

Background: Sustainability problems are urgent, and they need solutions quickly. They require people who can combine thorough problem-understanding with a solution orientation, produce socially robust and actionable knowledge that contributes to positive change, and handle the uncertainty and the need for ongoing adaptation in the process (The solution orientation of research is not to be misunderstood as "solutionism", which has been rightfully criticized, but as a training in evidence-based and responsible engagement with real-world issues (Miller et al., 2013)).

**Actionable knowledge
based on research**

Content: Therefore, student work in this curriculum is less about producing something for the class or the grade, and more about producing something in and for the world. Students learn about doing research and working scientifically; this includes disciplinary, inter- and transdisciplinary methods. Through research and problem-based learning in projects (Brundiers, Wiek & Redman, 2010; Brundiers & Wiek, 2013), students engage real-world issues in their local environments and employ research methods appropriate to the issue. They experience the high degree of uncertainty and risk of failure inherent to such endeavors. And rather than reproducing supposedly correct answers, they may or may not find meaningful answers through their research.

Examples: Students choose issues that are meaningful to them and then design and conduct research to address them; this process is mentored (rather than directed) by instructors. The results are publicly debated and made useful to stakeholders in the research.

Meta-level learning: Students learn about knowledge production as an intervention in the world and learn to situate academic knowledge production in that context. (Knowledge-making can also come in other forms, for example indigenous science.) Students learn to recognize, value, and engage different ways of making knowledge in relation to the task at hand. They learn to self-direct their learning: to identify the knowledge, skills, and methods they need in order to accomplish their task and how to seek out resources to acquire them.

Glocal learning: Transnational collaboration enables students to deal with problems in different geographical and cultural contexts. This fosters learning about differences in how problems and approaches to solutions are perceived and conceptualized in other contexts. It fosters understanding the context-specificity of sustainability problems as well as the connections between their local manifestation and global nature.

3) COLLABORATIVE LEARNING: ENGAGING WITH OTHERS

Background: The complex nature of sustainability problems requires collaborative endeavors if they are to be successfully addressed. Not only different academic disciplines, but also different professions and societal actors and groups need to contribute to their solution. This collaboration can take place locally as well as extend across different nations and cultures. It requires people who are highly skilled in working with others as well as in facilitating participatory processes.

**Diversity and intercultural
competencies**

Content: Therefore, students work less on an individual level, competing for the best grade, but rather in different collaborative settings. Collaborative learning is understood as a synergetic process in which personal, cultural, and disciplinary differences among the participants are actively used as resources for group problem solving (Barkley, Cross, & Major, 2005). Students also learn about collaboration: teamwork, communication, facilitation, as well as diversity and intercultural competencies are part of the curriculum.

Examples: Students work in research teams whose task is also to consciously engage in processes of team-building, conflict resolution, etc. Facilitating participation and group processes through appropriate methods is part of the course.

Meta-level learning: Students learn about collaboration as a field of expertise. They learn to assess their own capacities and to seek out opportunities to develop them further. They learn to assess participatory needs and how they can be met.

Glocal learning: The work in transnational teams adds issues of language, intercultural differences, and greater diversity to the collaborative setting. This provides opportunities to recognize one's own and others' cultural traits and how they influence perceptions and approaches to sustainability. The curriculum fosters a positive attitude and openness to difference, and the capacity to seek out opportunities for alternatives that only arise from the exchange between different participants.

4) PROFESSIONAL LEARNING: ENGAGING WORK ENVIRONMENTS

Background: Not only are today's work environments increasingly complex and international, in the field of sustainability new kinds of professions are constantly emerging. This requires people with a highly transferable set of professional skills, which they can adapt and extend as needed.

Content: Therefore, professional skills in this curriculum are less focused on one particular profession and more towards developing professional capacities that students may encounter in a variety of settings.

**Work environment
and skills**

Examples: Students co-create their own work environments, including teamwork, virtual platforms, use of technologies, communication forms, etc. They learn about and apply project management tools to their research project.

Meta-level learning: Students engage work environments as places where they can affect change and make a contribution. They learn to assess components of work environments (interpersonal, technological, etc.) and actively contribute to creating, adapting, and maintaining them so that the task at hand can be accomplished successfully.

Glocal learning: The transnational work environment provides opportunities to engage in virtual work environments and learn how to meet their particular challenges, from different time zones to different technological equipment and conditions to the particularities of successful communication and group dynamics in virtual environments.

5) PERSONAL LEARNING: ENGAGING THE SELF

Background: Sustainability problems are strongly influenced by social paradigms, ways of thinking, and values. Sustainability itself is a highly normative discourse that remains contested and is constantly being negotiated while at the same time guiding societal change (Redclift, 1993). This requires people who are capable of reflecting on their own as well as on societal paradigms and their impact on the world, and who can engage normativity itself, rather than replacing one norm with a new one.

Content: Therefore, this curriculum is less focused on socializing students into a discipline or profession, but rather on questioning the norms, practices, and values of such socialization processes. Personal learning through engaging student values and beliefs in relation to the curriculum fosters reflectivity and metacog-

**Reflecting norms and
values**

dition, which lies at the heart of sustainability competencies (Rychen, 2009). Active and critical citizenship is a main component of the glocal curriculum (de Oliveira Andreotti, 2006).

Examples: Students have regular opportunities for structured reflection about their learning, both on content, and its meaning for their own worldviews and values, together with practice on how to share these perspectives in respectful and constructive ways.

Meta-level learning: Students learn about concepts of self, identity, and subjectivity, as well as their formation processes. They learn to articulate their own positions with regard to sustainability, how to continuously reflect and adapt them with regard to learning, and to develop civic competence to participate in political processes that establish such positions and values in communities.

Glocal learning: Transnational collaboration provides learning opportunities to explore values and norms in their particular historical, political, and cultural contexts. This fosters capacities to recognize one's own values and norms as contextual, to understand discursive positions as specific rather than universal, and to constructively engage in conversations beyond what might be perceived as right or wrong.

Expertise of a change agent

As a whole, these learning areas cover the fields of expertise change agents will need. These are usually not all (or inadequately) covered in conventional curricula, and even in innovative curricula geared towards integrative learning, there may be imbalances due to lack of time, teaching expertise, or resources. The description of the learning areas makes clear that each one has its own educational goals, and therefore requires its own teaching and learning opportunities. By explicitly designating space for these five areas in the curriculum, they function as placeholders to help you structurally implement each area's particular contents and learning goals. This means that instead of building from what and who is already there—and possibly limiting your vision by those boundaries before it can unfold—you start with what a glocal curriculum for change agents requires, and then engage in an iterative process of negotiating what is possible. This approach will usually lead to creative ideas and to discovering more possibilities and resources than expected. And it is definitely more enjoyable and inspiring!

Placeholders in the curriculum

Conscious choices for intended learning outcomes

Within each learning area, you choose intended learning outcomes and teaching concepts and match them with learning opportunities. In this way, the learning areas can support you in making conscious choices from the “what” and “how” aspects of the curriculum towards the “why”: enabling students to develop subjectivities that can actively engage the challenges of this century on global and local scales as well as across geographical and cultural contexts. Below is an example of what a first draft of a curriculum structured by these learning areas could look like:

LEARNING AREA	WHAT AND HOW: CONTENT AND TEACHING CONCEPTS	WHY: EDUCATIONAL GOALS
1. Subject learning: engaging kinds of knowledge	Learning <i>about</i> a topic (in sustainability) through problem-based, multimodal, and interdisciplinary approaches; critically situating kinds of knowledge	<i>Critical and transformative thinkers</i>
2. Research learning: engaging the world	Learning <i>through</i> engaging in a solution-oriented inter- and possibly transdisciplinary research project; actively producing knowledge	<i>Productive and ethical researchers</i>
3. Collaborative learning: engaging with other	Learning <i>with</i> others: working in teams and with stakeholders; actively building collaborative competencies and skill sets	<i>Capable and empathic collaborators</i>
4. Professional learning: engaging work- environments	Learning <i>as</i> professionals: building the necessary professional and technological skills to put learning into practice and participate successfully in complex work environments	<i>Skilled and motivated professionals</i>
5. Personal learning: engaging the self	Learning <i>for</i> a good life: becoming the person and active citizen you want to be in the world. Building reflectivity and self-direction; engaging values	<i>Reflective and engaged personalities</i>

Background Box 10 Overview of learning areas in the glocal curriculum

In each area, learning will be built up over the course of the program. They can be metaphorically understood as streams that run simultaneously through the curriculum, actively engaged with from beginning to end of the program, and are integrated in activities and assignments. In that manner, they provide vertical and horizontal integration through:

- a. continuity over time, revisiting and building competencies and skills in each area on subsequently more complex levels, and
- b. integration between and within classes, multiplying learning opportunities in each area.

The particular structure of this model curriculum—the combination of curriculum dimensions and learning areas—is therefore not meant to provide a new set of key competencies for sustainability. Rather, we engage the existing ones in a different way: we structure them through fields of expertise (the learning areas) in which learning and competence development (through knowing, acting, and being) can take place. This framework is intended as a curriculum structure that is useful for designing glocal curricula across different approaches to sustainability-related competencies.

New application of existing competencies

2.1.2 How to Structure your Curriculum through the Learning Areas

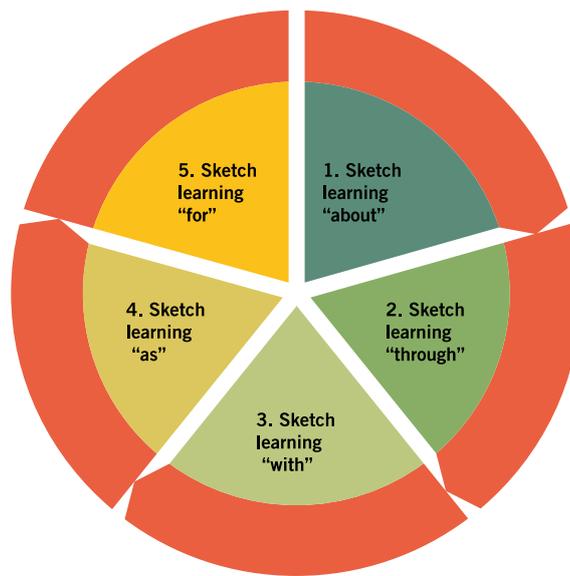


Figure 11 Overview: how to structure your curriculum with learning areas

Structuring your curriculum means providing answers to a number of key questions.

- What kind of topics and knowledge will students (learn to) engage, and how?
- What kinds of knowledge will students (learn to) produce, and how?
- How will students (learn to) collaborate?
- What kind of environments will students (learn to) work in, and how?
- How will students (learn to) engage and develop on a personal level?

To begin sketching out your curriculum concept, you can engage these questions in more detail:

LEARNING AREAS	WHAT AND HOW?	WHY: EDUCATIONAL GOALS
<p>1. Subject learning:</p> <p>engaging kinds of knowledge</p>	<p>Learning <i>about</i> a topic:</p> <ul style="list-style-type: none"> • What is your topic area? • Which disciplinary and other knowledge perspectives will students use to engage the topic? • How will knowledge about the topic be examined and critically situated in its historical, cultural, and political contexts? 	<p><i>Critical and transformative thinkers</i></p>
<p>2. Research learning:</p> <p>engaging the world</p>	<p>Learning <i>through</i> engaging:</p> <ul style="list-style-type: none"> • How will your students engage real-world issues? • How will they produce knowledge of the issue? • How will knowledge-making be examined as a powerful intervention in the world? 	<p><i>Productive and ethical researchers</i></p>
<p>3. Collaborative learning:</p> <p>engaging with others</p>	<p>Learning <i>with</i> others:</p> <ul style="list-style-type: none"> • What will be the formats students collaborate in? • How will they learn to collaborate in different settings with different participants? • How will working with others be examined in light of diversity, interculturality, and justice? 	<p><i>Capable and empathic collaborators</i></p>
<p>4. Professional learning:</p> <p>engaging work environments</p>	<p>Learning <i>as</i> professionals:</p> <ul style="list-style-type: none"> • Which kinds of work environment will your curriculum provide or require students to engage in? • Which professional competencies and skills will students learn to acquire? • How will understandings of work, work ethos, and different professional cultures be examined? 	<p><i>skilled and motivated professionals</i></p>
<p>5. Personal learning:</p> <p>engaging the self</p>	<p>Learning <i>for</i> a good life:</p> <ul style="list-style-type: none"> • Which forms of regular, structured reflection will the curriculum provide? • How will students be encouraged to bring their personal socio-cultural specificities and values to the learning process? • How will concepts of self, identity, subjectivity, and citizenship be engaged? 	<p><i>Reflective and engaged personalities</i></p>

2.1.3 Further Reading

Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., Thomas, C. J. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7(S1), 25–43. <https://doi.org/10.1007/s11625-011-0149-x>

Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: from classroom into the real world. *International Journal of Sustainability in Higher Education*, 11 (4), 308–324.

De Oliveira Andreotti, V. (2006). Soft versus critical global citizenship education. *Policy & Practise - A Development Education Review*, 40–51.

Barkley, E. F., Cross, K. P., & Major, C. H. (2005). *Collaborative Learning Techniques: A Handbook for College Faculty*. The JosseyBass Higher and Adult Education Series (Vol. 1)

2.2 CURRICULUM DESIGN: INTEGRATING “WHY”, “WHAT”, AND “HOW”

Integration by scaffolding

Curriculum (and program) design is an entire field of study with a wealth of knowledge and expertise. In this Handbook, we address curriculum design through the particular model of the glocal curriculum in a transnational collaboration, not curriculum design per se. The design process of a glocal curriculum that can support the education of change agents in our interconnected world is quite interesting: it extends across disciplines and across a multitude of subjects, changing the understanding of educational goals, the range of intended learning outcomes, and the kind of teaching concepts needed. In Section 2.2, the learning areas are employed as a structure—like a scaffold—for such a curriculum design.

DEFINITIONS: EDUCATIONAL GOALS, INTENDED LEARNING OUTCOMES, TEACHING CONCEPTS

Educational goals *orient*: They describe the intention and overarching goals of the curriculum.

Intended learning outcomes *specify*: They describe kinds of knowledge, skills, and competencies students can ex-

pect to have acquired (and are expected to demonstrate) at the end of the program.

Teaching concepts *make possible*: They describe the ways of teaching and learning through which the educational goals and intended learning outcomes can be achieved.

Background Box 11 Definitions: educational goals, intended learning outcomes, teaching concepts

2.2.1 “Why”: Specifying Educational Goals

“Educational goals generally describe the broader intention and a more general orientation of what is on offer in the [curriculum,] course or programme” (Barth, 2015, p. 57). Choosing the overarching educational goals of a curriculum will determine everything that makes up the educational experience; therefore, this step should be considered carefully. The idea of the engaged citizen or change agent guides the glocal curriculum presented in this Handbook, and the educational goals consequently reflect a sense of being. However, what is the goal of this engaging and making change?

Specific goals

Here, we touch on a long-standing debate in the fields of environmental and sustainability education. One end of the spectrum emphasizes the urgent need for transformation towards sustainability to address massive socio-ecological crises, and rightfully points out that education is both a deep leverage point for social transformation, and, with its educational institutions, also an actor within society that has responsibilities towards society (de Kraker, Lansu, & van Dam-Mieras, 2007). On the other end of the spectrum, critics also rightfully point out that education should not be instrumentalized towards prescribed ends, that this in fact contradicts the purpose of education as empowering people to think and choose for themselves. Education for sustainable development (ESD), especially in higher education (HESD), then necessitates the question: who defines the contested concepts of “sustainable development”, and who participates in shaping the discourse of “sustainability”? Jickling and Wals (2008, p. 4) point out that in context of globalization “powerful world bodies, such as the World Bank, the World Trade Organization, and UNESCO [...] influence educational policy agendas on a global scale”. If sustainable development becomes defined by certain agendas (such as neo-liberalism), there is a very real danger that educating for sustainable development then will also promote “a certain kind of citizenship, particularly one that serves, or at least doesn’t question, (that) agenda” (Jickling & Wals, 2008, p. 4). How then can educational goals reflect a concept of change agents who are able to think critically about sustainability and its different discourses and approaches, and participate in further developing such concepts in processes of equitable, democratic, and civic engagement, while at the same time actively co-creating solutions to sustainability problems and furthering social transformation processes guided by those constantly evolving concepts?

Education and transformation

Influential in education

Consequences for educational goals

In light of this debate, the educational goals for the learning areas of the glocal curriculum are framed in the following way:

1) SUBJECT LEARNING: ENGAGING KINDS OF KNOWLEDGE

Critical thinkers are able to situate kinds of knowledge in their historical, political, and cultural contexts (discourse literacy); critically analyze, evaluate, and select different kinds of knowledge—across disciplines and including non-academic kinds of knowledge—in relation to specific issues and the context in which they are found; as well as constructively deal with ambiguity, complexity, and epistemic pluralism.

Critical thinkers

Transformative thinkers are able to rethink current issues and discourses without automatically re-enacting fixed patterns of thought and action; as well as identify structures and paradigms that underlie current systems and re-envision different possibilities.

Transformative thinkers

2) RESEARCH LEARNING: ENGAGING THE WORLD

- Productive researchers** Productive researchers are able to co-produce socially robust and actionable knowledge that contributes to solving real-world problems and making positive change towards more ecologically and socially sustainable societies. In order to do that, they are able to appropriately employ academic research skills (from formulating appropriate questions to choosing and applying the right methods and communicating results to different audiences) as well as respect and constructively engage other modes of knowledge production (for example, community knowledge).
- Ethical researchers** Ethical researchers are able to critically reflect on the (possible) impact of their actions on different constituencies, avoid instrumentalizing participants and their knowledge, and assess trade-offs in light of intra- and intergenerational equity concerns.

3) COLLABORATIVE LEARNING: ENGAGING WITH OTHERS

- Capable collaborators** Capable collaborators are able to work well with others; actively participate as well as facilitate the participation of others; constructively engage and if possible resolve conflicts; engage social, cultural, disciplinary and other forms of diversity in respectful and synergetic ways, including working in cross-cultural settings; as well as be attentive to and facilitate equitable participation.
- Empathic collaborators** Empathic collaborators are able to build relationships and support relationship-building among participants; connect emotionally; and imagine and be curious about lived realities and perspectives different from their own.

4) PROFESSIONAL LEARNING: ENGAGING WORK ENVIRONMENTS

- Skilled professionals** Skilled professionals are able to identify, learn, and employ the necessary personal and technological skills to successfully participate in local and virtual work environments; adapt to and integrate different professional cultures.
- Motivated professionals** Motivated professionals are able to seek out or even create meaningful work; co-create new fields of work as they are needed in sustainability transitions; as well as motivate others in work environments.

5) PERSONAL LEARNING: ENGAGING THE SELF

- Reflective personalities** Reflective personalities are able to recognize their own social, cultural, and political specificity and its influence on their perceptions, values, and worldview; be open to questioning these through learning experiences; as well as critically reflect on normativities and their contexts.
- Engaged personalities** Engaged personalities are able to: employ skills and abilities needed for effective democratic, civic participation; self-direct and motivate towards chosen goals; as well as motivate others to become active.

2.2.2 “What”: Determining Intended Learning Outcomes

“Intended learning outcomes specify what knowledge or skills or even attitudes the students should be able to demonstrate at the end of the course or programme” (Barth, 2015, p. 57). The approaches to determining what should be learned to create the set of key competencies and intended learning outcomes of your curriculum can be roughly distinguished into five conceptual approaches to sustainability:

Based on sustainability as an educational project, with educators as experts (higher education for sustainable development), describing a range of competencies relevant across disciplines and education types (Barth, 2015, pp. 57, 65; Barth, Godemann, Rieckmann, & Stoltenberg, 2007; Bormann & de Haan, 2008; Rychen, 2009; UNESCO, n.d.).

Based on sustainability as a profession, describing the knowledge and skill profile of change agents in regard to new workplaces and objectives for sustainability professionals, and characterized by emphasizing professional knowledge, skills, and attributes (Barth, 2015, p. 57; Wesselink & Wals, 2011; Willard et al., 2010).

Based on unsustainability as a particular type of problem to be solved, with sustainability science as a major contributor, describing the key competencies necessary to contribute to sustainability problem-solving (Wiek, Withycombe, & Redman, 2011).

Based on sustainability as development, determining competencies and skills regarding the most relevant fields involved in development efforts, often with a distinct focus on the global south, poverty alleviation and quality of life issues, north- south relations (Massey, 2004; McArthur & Sachs, 2009; Willard et al., 2010).

And based on sustainability as an emancipatory project, focusing on capacities to rethink systems and shift their constituting paradigms in light of justice, equity, and power (Agyeman, 2005, 2013; de Oliveira Andreotti, 2014; Lotz-Sisitka, Wals, Kronlid, & McGarry, 2015; Martusewicz, Edmundson, & Lupinacci, 2015).

Based on those different conceptual approaches to sustainability, curriculum choices may prioritize, or leave out, one or more approaches to determining educational goals. We do not propose that any one approach is better than another, but emphasize the importance of making conscious choices based on awareness of their differences and the implications for the specific curriculum (Barth, 2015). Looking at the curriculum through the lens of learning areas encourages us to consider what our choice of conceptual approach to sustainability offers in each area, as well as where other approaches may have something to contribute that might be complementary. It also ensures that no learning area is overemphasized or left out entirely, if the chosen (or implicit) conceptual approach to sustainability doesn't adequately include it.

Across all conceptual approaches, sustainability education is generally understood as competence-based education, which means on a very basic level shifting the focus from inputs to outcomes, from units of teaching to what students will be able to accomplish. This doesn't refer to specific actions in predefined

Intended learning outcomes for sustainability

Sustainability as an educational project

Sustainability as a profession

Unsustainability as a particular type of problem to be solved

Sustainability as development

Sustainability as an emancipatory project

Shift to accomplishment

Two approaches to sustainability competencies

situations, but rather to “the ability to successfully meet complex demands in a particular context through the mobilization of psychosocial prerequisites (including both cognitive and non-cognitive aspects). This represents a demand-oriented or functional approach to defining competencies” (Rychen & Salganik, 2003, p. 43). It is also a holistic understanding of competence, which includes cognitive, practical, motivational, emotional, behavioral, and social components, as well as the specific contexts and demands that call for the competence-based action (Weinert, 2001). The glocal curriculum presented in this Handbook draws primarily on the following approaches to sustainability competencies:

DeSeCo key competence framework

First, the DeSeCo key competence framework, which is based on an international project “initiated to provide solid theoretical and conceptual foundations for the broad range of competencies that are needed to face the challenges of the present and the future” (McGaw, 2003). This framework has strongly influenced the founding documents of education for sustainable development (ESD and HESD) and so the development and implementation of sustainability education, including various understandings and models of sustainability competencies. It was further developed in the course of the UNESCO Decade on ESD and Agenda 21, where a prominent example is the *gestaltungskompetenz* concept, which means: “the specific capacity to act and solve problems. Those who possess this competence can help, through their active participation in society, to modify and shape the future of society, and to guide its social, economic, technological and ecological changes along the lines of sustainable development. [...] without such changes always being merely a reaction to pre-existing problems” (de Haan, 2006, p. 21).

Gestaltungskompetenz

THE DESECO FRAMEWORK FOR DETERMINING KEY COMPETENCIES HAS TWO GROUNDING ORIENTATIONS:

Reflectivity as the core of all key competencies:
The complex demands of the present require “critical and reflective thought- and action-processes [...] on a level of] higher mental complexity[...] we use the term ‘reflectivity’, which relates to the required competence level. This means abilities beyond either-or, such as connected thinking, creativity, a critical stance, a high problem consciousness, metacognition (thinking about thinking)” (Rychen, 2008, p. 17).

Key competencies as aligned with global values and goals:
Since key competencies are meant to enable people to shape the world rather than to simply live within existing structures, they cannot be defined apart from societal objectives. DeSeCo refers explicitly to the democratic value system and sees values like they have been anchored in the declaration of universal human rights and the declaration of Rio about environment and development (among others) as normative directions for the definition, teaching, and assessing of key competencies (Rychen, 2008, p. 17).

Within those two fundamental orientations, the frame-

work defines three main categories of key competencies at the 1st level, each with three sub-categories at the 2nd level, while *gestaltungskompetenz* elaborates these further at a 3rd level. Taken together, they give a good overview of how the concept of key competencies for developing a sustainable society respond to the realities and needs of our present, and how they ground the kind of education the glocal curriculum aims for.

1. Interacting in socially heterogeneous groups

- Relating well to others
- Cooperating and working in teams
- Managing and resolving conflict
 - Cosmopolitan perception, transcultural understanding and collaboration
 - Ability to plan and act (implementation) with others
 - Ability to participate in decision-making processes
 - Ability to motivate others to become active



2. Acting autonomously (refers to “individuals empowered to navigate the social space and to manage their lives in meaningful ways”, and to “participating effectively in the development of society”)

- Acting within the big picture or the larger context
- Forming and conducting life plans and personal projects
- Defending and asserting one’s rights, interests, limits, and needs
 - Ability to reflect one’s own values and world-view (individual and cultural models) as well as those of others
 - Capacity for empathy, compassion, and solidarity (related to intra- and intergenerational justice)
 - Ability to motivate oneself to become active

3. Using tools interactively (both physical and socio-cultural tools)

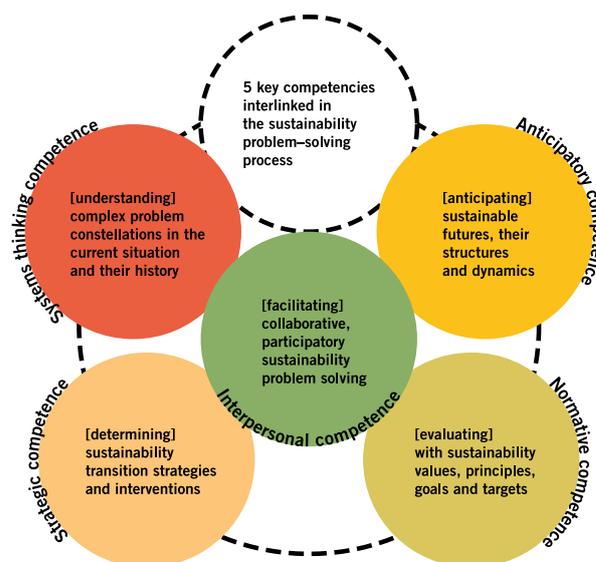
- Using language, symbols, and text interactively
- Using knowledge and information interactively
- Using technology interactively
 - Building new knowledge by integrating new (global-local) perspectives
 - Gaining new insights through interdisciplinarity
 - Anticipatory (or foresight) thinking and acting

(Bormann & de Haan, 2008; de Haan, 2006; Based on Rychen & Salganik, 2003)

Background Box 12 Deseco and gestaltungskompetenz, key competencies

The second approach to competencies the global curriculum draws on is a framework of sustainability problem-solving that determines key competencies for sustainability by their function in this process (Wiek et al., 2011). This approach is understood as situated within the approach above, and is particularly suited to research-based learning in problem and project-based formats.

Problem solving competencies



Background Box 13 Key competencies for sustainability problem solving (adapted from Wiek et al., 2011)

Disciplinary backgrounds of curriculum developers

Another not to be underestimated influence on choosing what should be learned is the disciplinary background of those participating in curriculum development, and the departments in which the programs are located. Sustainability education is generally understood as interdisciplinary education; however, courses and programs often emerge from and are located in the context of environmental studies, which have an emphasis on the natural sciences. Even though sustainability is described as a field requiring contributions from all disciplines, the reality of sustainability programs shows the same bias towards natural sciences, at the expense of the social sciences (O’Byrne, Dripps, & Nicholas, 2015). Given that glocal curricula have interdisciplinarity as a fundamental goal, it is prudent to examine the curriculum in that respect: how is interdisciplinarity structurally implemented and put into practice? And how do curriculum designers openly deal with their disciplinary expectations towards what the curriculum should look like?

SHARED DEVELOPMENT OF LEARNING OUTCOMES

A number of people participated in the development of the Global Classroom curriculum. Sometimes conflicts arose over translating the larger educational goals into learning outcomes—what one person considered highly important, another thought marginal. It took us a while to understand that not only did our different disciplinary backgrounds influence our opinions (for example prioritizing natural science ap-

proaches over concerns located in the social sciences), but also our socializations in different conceptual approaches to sustainability were in play.

When co-designing curricula, it is helpful to be attentive to and openly discuss the influences of the disciplinary and conceptual backgrounds of the participants, rather than assume that a shared commitment to sustainability education automatically provides everyone with a common ground.

Global Classroom Example 6 Shared development of learning outcomes

LEARNING AREAS	WHAT: INTENDED LEARNING OUTCOMES	WHY: EDUCATIONAL GOALS
<p>1. Subject learning:</p> <p>engaging kinds of knowledge</p>	<p>Learning <i>about</i> “sustainable urban development—a contradiction in terms?”</p> <ul style="list-style-type: none"> • Identify sustainability issues in cities; recognize different manifestations in different local environments (transnationally) • Analyze issues from different disciplinary perspectives, and through historical, cultural, and political specificities of place • Describe complex interactions and feedback loops in cities as systems <p>Key competencies: systems thinking, normative competence, critical thinking, information and discourse literacy</p>	<p><i>Critical and transformative thinkers</i></p>



<p>2. Research learning:</p> <p>engaging the world</p>	<p>Learning <i>through</i> engaging in research on real issues in local environments</p> <ul style="list-style-type: none"> Describe solution-oriented research as an approach Design and conduct such a research project, with local and transnational elements Self-direct the research process Understand and apply specific disciplinary methods as well as inter- and transdisciplinary methods appropriate to the research project <p>Key competencies: systems thinking, anticipatory and strategic competence</p>	<p><i>Productive and ethical researchers</i></p>
<p>3. Collaborative learning:</p> <p>engaging with others</p>	<p>Learning <i>with</i> others</p> <ul style="list-style-type: none"> Work successfully in transnational teams Describe and apply methods of teamwork Constructively engage social, cultural, and disciplinary differences in the team Practice conflict resolution methods <p>Key competencies: intra- and interpersonal competence, diversity and intercultural competence, participatory competence (collaborative competencies)</p>	<p><i>Capable and empathic collaborators</i></p>
<p>4. Professional learning:</p> <p>engaging work environments</p>	<p>Learning <i>as</i> professionals</p> <ul style="list-style-type: none"> Describe and apply methods of project management Create and maintain a virtual work environment suitable to the research project and its members Select technologies and tools appropriate to the work to be done; learn to use them as needed Present and discuss skillfully in virtual as well as local environments <p>Key competencies and skills: collaborative competencies, technological and media literacy, strategic competence</p>	<p><i>Skilled and motivated professionals</i></p>
<p>5. Personal learning:</p> <p>engaging the self</p>	<p>Learning <i>for</i> a good life:</p> <ul style="list-style-type: none"> Recognize and contextualize one's own social, cultural, and disciplinary specificity and patterns Describe and reflect on one's own values and beliefs Self-direct one's own learning process Participate in evaluating and further developing the learning environment <p>Key competencies: reflectivity, participatory competence, critical literacy</p>	<p><i>Reflective and engaged personalities</i></p>

Global Classroom Example 7 Choices for intended learning outcomes

2.2.3 “How”: Engaging Transformative Teaching Concepts

Similarly, there are different approaches to *how* such learning could take place so that it enables students to build the chosen set of competencies and achieve the intended learning outcomes. What they have in common is a vision of teaching as transformative rather than transmissive, in that they aim to enable fundamental change in students rather than reproducing existing patterns of thought and action. Some of these transformative teaching concepts are (adapted from Sipos et al., 2008):

TRANSFORMATIVE TEACHING CONCEPTS—A SELECTION

Action learning

A form of experiential learning in which peer learners help each other question their assumptions and, ideally, experience a paradigm shift before applying their learning in new situations (Battisti, Passmore, & Sipos, 2008; Brockbank & McGill, 2004; Cowan, 2012).

Collaborative learning

An educational approach that understands learning as a synergetic joint process in which differences (personal, cultural, disciplinary, etc.) among the participants are actively engaged as resources for group problem-solving and knowledge production (Barkley et al., 2005; Bielaczyc & Collins, 1999; Dillenbourg, 1999).

Community service learning

An educational approach that integrates service in the community with intentional learning activities. In successful Community Service Learning projects, members of educational institutions and community organizations work together toward outcomes that are mutually beneficial (Butin, 2005).

Critical emancipatory pedagogy

An educational approach to ways of facilitating learning that arises from an emancipatory tradition, focusing on social justice and equity amongst classes, races, genders, etc. (Adams, Bell, & Griffin, 2007; Czollek & Perko, 2012; Freire, 1996; Johnson, 2002).

Environmental education

An approach to teaching and learning that provides people with experience and knowledge to examine so-

cio-ecological interrelationships and develop responsibility for our environments (Stevenson, Brody, Dillon, & Wals, 2013).

Experiential learning

An educational approach that gives students opportunities to apply learning in practice, and learn in real-world situations such as research and service-learning projects. It connects education, work, and personal development, or “head, hands, and heart” (Sipos et al., 2008), thereby emphasizing the cognitive, psychomotor, and affective domains of competence development (Kolb, Boyatzis, & Mainemelis, 2000; Sipos, et al., 2008).

Interdisciplinary learning

An educational approach that facilitates the development of awareness of and ability to use different disciplinary contributions to understanding an issue (Bammer, 2013; Ivanitskaya, Clark, Montgomery, & Primeau, 2002; Borrego & Newswander, 2010; Defila & Di Giulio, 1998).

Pedagogy for eco-social justice or environmental justice

An educational approach for learning that is located at the intersection of ecological sustainability and social justice, and provides innovative approaches to understanding sustainability and sustainability problem solving (Agyeman, 2005; Bowers, 2002; Martusewicz et al., 2015).

Problem-based learning

A framework for learning that is focused and organized around the experiential investigation of real-world problems. Authentic experiences foster active learning, support knowledge construction, and integrate school learning and real life (Hmelo-Silver, 2004).

Project and problem-based learning (PPBL)

An educational approach that combines problem-based and project-based together with experiential learning so that students engage with real-world problems through research projects that explicitly focus on producing evidence-based solution options (Brundiens & Wiek, 2013; Wiek et al., 2014).

Participatory action research

An umbrella term in social science that refers to the equitable involvement of participants in the research process, which explicitly includes a commitment to empowerment and social change, as well as aspects of social learning. There are many ways to define participation, action and what exactly constitutes “research” (Tayler, 1992).

Research-based learning

An educational approach that gives students the opportunity to engage in research that is geared towards producing knowledge meaningful for others. It exposes students to the process of knowledge production, including risk of failure and the need for adaptation. It strongly

focuses on self-directed learning as well as learning how to work scientifically (Brundiens et al., 2010).

Self-directed learning

An approach to learning developed in adult education that emphasizes the active part of the learner in developing knowledge (rather than its transfer through a teacher). It focuses on personal autonomy and responsibility for the entire learning process, even where learning takes place in social and educational contexts. As a teaching concept, its goal is to enable the learner to engage in meaningful learning beyond the educational setting (Loyens, Magda, & Rikers, 2008; Straka, 2000).

Multimodal knowledge engagement

An approach to knowing that argues for acknowledgement of more diverse kinds of knowledge (as opposed to exclusively Western science), including for example traditional ecological knowledge, knowledge bases built by local or traditional resource users, as opposed to “experts” (Turner, Ignace, & Ignace, 2000).

Background Box 14 Transformative teaching concepts—a selection+

Here, too, designing a glocal curriculum for change agents requires making informed choices. For selecting transformative teaching concepts it is an important criterion to take into account needed educational paradigm shifts:

Paradigm shifts

- a. From predominantly disciplinary knowledge acquisition to inter- and trans-disciplinary engagement of different kinds of knowledge in relation to real-world issues
- b. From predominantly reproducing “correct” knowledge to relevant knowledge-making that takes into account uncertainty and risk of failure
- c. From predominantly teaching-centered and prescriptive to student-centered and self-directed learning
- d. From predominantly individual and competitive learning to collaborative and synergetic learning
- e. From predominantly learning skills related to a specific profession to learning skills that are transferable to new emerging areas and forms of work
- f. From predominantly intellectual and cognitive learning to also including deeply personal and non-cognitive and affective engagement

KEY COMPONENTS OF TEACHING THE GLOCAL CURRICULUM

Based on the combination of curriculum dimensions and learning areas, we find the following five components of teaching the glocal curriculum to be necessary:

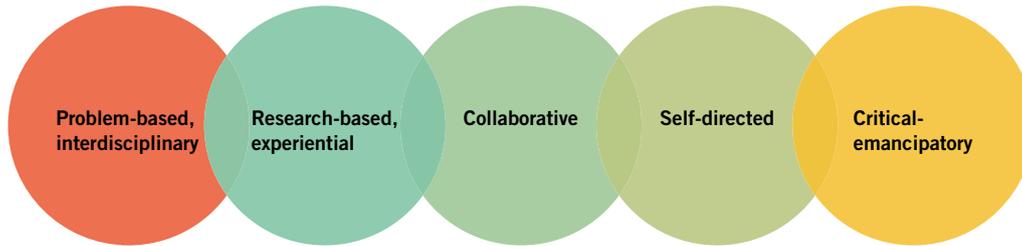
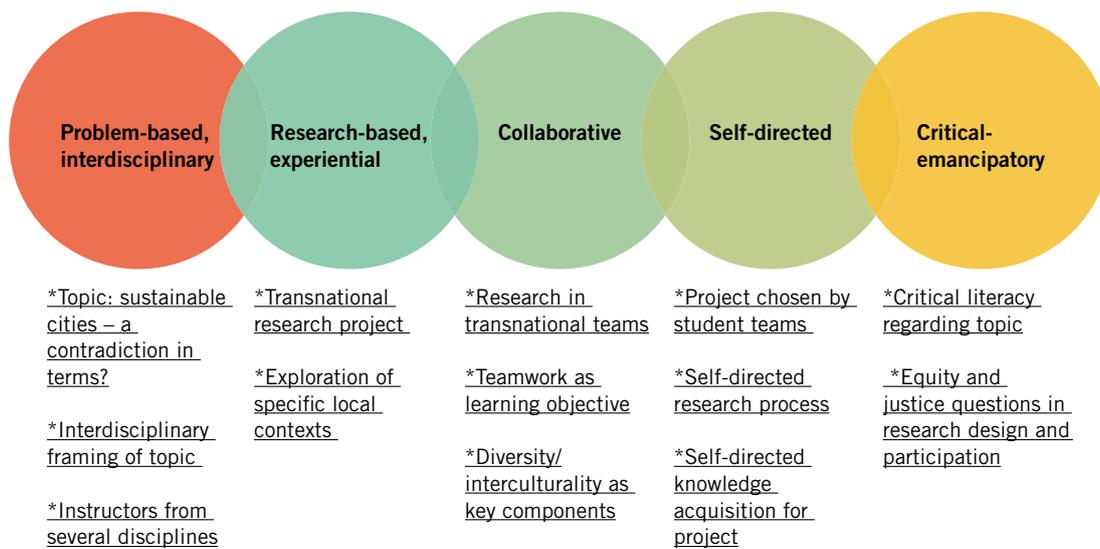


Figure 12 Key components of teaching the glocal curriculum

Problem-based, interdisciplinary component	The problem-based, interdisciplinary component responds to the complex nature of sustainability problems. Interdisciplinary learning environments need to meet three criteria: 1) interdisciplinary framing of and learning about the topic, 2) presence and conscious engagement of participants from multiple disciplines, and 3) learning about methods of interdisciplinarity as well as developing reflexivity regarding (one's own and others') disciplinary "worldviews" (Defila & Di Giulio, 1998). This helps to make the important distinction to multidisciplinary environments, where multiple perspectives may be presented, but not necessarily interconnected or synergized in understanding a topic. In addition, kinds of knowledge beyond academic disciplines are important to engaging sustainability issues: multimodal ways of knowing are part of the curriculum.
Research-based, experiential component	The research-based, experiential component is necessary because sustainability issues are manifested in real-world situations, which therefore also provide the learning context for them. Engaging with real issues, with the goal of contributing to solutions and/or societal learning, allows students to connect deeply with issue and context. This can provide a strong motivating effect to participate in this kind of situated learning, in which transferable problem-solving competencies can be developed.
Collaborative component	The collaborative component responds to the necessity of addressing sustainability issues collaboratively across boundaries and borders. Collaborative learning settings emphasize the social (in contrast to individual) element of competence development and provide opportunities for such shared, synergetic knowledge production. It is therefore important to distinguish collaborative from cooperative learning, where a division of labor is undertaken to be more efficient.
Self-directed learning component	The self-directed learning component is made necessary by the nature of sustainability transformation as an ongoing social learning process. Students need opportunities to become life-long learners who can assess challenges and then take responsibility for acquiring needed competencies at all stages of their learning process. This understanding of self-directed learning is different from individualized learning, where students are in control of engaging with learning opportunities, but may or may not develop competencies to understand and direct their own learning process.
Critical emancipatory component	The critical emancipatory component responds to the situatedness of sustainability issues as well as discourse in an unequal world. Sustainability problems affect groups of people unequally, and structural inequalities affect their opportunities for participation in sustainability transformation as well as knowledge production. Addressing the equity and justice components of sustainability requires critical literacy—of both text and world/environments—which goes far beyond critical thinking as a basic academic competence (Klinsky & Golub, 2016).

These five key components of teaching the glocal curriculum can be put into practice in different settings and through different pedagogies. The question of how we teach and learn for sustainability also has potential for transforming universities: "When sustainability is treated not only as a topic that is added to the

curriculum, but also brings new ways of teaching and learning, it is most likely to unfold its potential for further change” (Barth, 2015).



Global Classroom Example 8 The key components of teaching the global curriculum.

The key feature of our Global Classroom was that students conducted a transnational research project focusing on an urban sustainability issue that was manifested in both local environments. This was facilitated through problem and project-based learning. The research was framed through research-based learning as well as through the sustainability problem-solving framework in sustainability science (Wiek et al., 2011). The student research projects were also designed with an interdisciplinary approach through teaching on the subject of urban sustainability by instructors from different disciplines, and students drawing on different materials as needed for their projects, as well as coaching of the student projects by two instructors from different disciplines, and actively engaging the disciplinary backgrounds of the students in their teams. Transdisciplinary elements were included where students worked with non-academic stakeholders. In this inter- and transdisciplinary research context, we drew on a variety of teaching methods and learning settings to engage the necessary competencies and skills in all learning areas. Below is a sample of the choices we made in regards to teaching concepts for the Global Classroom.

LEARNING AREAS	WHAT: INTENDED LEARNING OUTCOMES	HOW: TEACHING CONCEPT
<p>1. Subject learning:</p> <p>engaging kinds of knowledge</p>	<ul style="list-style-type: none"> Identify sustainability issues in cities; recognize different manifestations in the local environments and compare transnationally Analyze issues through different disciplinary perspectives, and through the historical, cultural, and political specificities of place Describe complex interactions and feedback loops in cities as systems <p>Key competencies: systems thinking, normative competence, critical thinking, information and discourse literacy</p>	<ul style="list-style-type: none"> Problem-based learning: concrete issues in specific cities Interdisciplinary learning: materials and lectures from instructors with different disciplinary perspectives “Flipped classroom”: lectures via video, transnational classroom sessions based on student presentations and discussions
<p>2. Research learning:</p> <p>engaging the world</p>	<ul style="list-style-type: none"> Describe solution-oriented research Design and conduct such a research project with local and transnational elements Understand and apply specific disciplinary methods as well as inter- and transdisciplinary methods appropriate to research project <p>Key competencies: systems thinking, anticipatory and strategic competence</p>	<ul style="list-style-type: none"> Project and problem-based learning Research-based learning Inter- and transdisciplinary learning Collaborative learning
<p>3. Collaborative learning:</p> <p>engaging with others</p>	<ul style="list-style-type: none"> Work in transnational teams Describe and apply methods of teamwork Describe and facilitate forms of team process and participatory methods with external participants Constructively engage difference (social, cultural, disciplinary) in the team Practice conflict resolution methods <p>Key competencies: intra - and interpersonal competence, diversity and intercultural competence, participatory competence (collaborative competencies)</p>	<ul style="list-style-type: none"> Collaborative learning Experiential action learning Training in teamwork and project management, coaching application of best practices in team Training in diversity and intercultural competence, coaching in team <ul style="list-style-type: none"> —Critical emancipatory approaches to diversity and interculturality Training in participatory methods and stakeholder involvement



<p>4. Professional learning:</p> <p>engaging work environments</p>	<ul style="list-style-type: none"> • Describe and apply methods of project management • Create and maintain a virtual work environment suitable to the research project and its members • Select technologies and tools appropriate to the work to be done; learn to use them as needed • Present and discuss skillfully in virtual as well as local environments <p>Key competencies and skills: collaborative competencies, technological and media literacy, strategic competence</p>	<ul style="list-style-type: none"> • Project-based learning • Experiential action learning • Collaborative learning • Training in use of technologies, behaviors, and practices in virtual environments
<p>5. Personal learning:</p> <p>engaging the self</p>	<ul style="list-style-type: none"> • Recognize and contextualize one's own social, cultural and disciplinary specificity and patterns • Describe and reflect on one's own values and beliefs • Self-direct one's own learning process • Participate in evaluating and further developing the learning environment <p>Key competencies: reflectivity, participatory competence, critical literacy</p>	<ul style="list-style-type: none"> • Action learning • Self-directed learning • Peer learning • Assessment-as-learning

Global Classroom Example 9 Choosing teaching concepts

2.2.4 Closing the Gaps Between Educational Goals and Learning Opportunities

Even when our global curriculum includes the appropriate educational goals, intended learning outcomes, and transformative teaching concepts—we have not yet answered the second challenge. How do we implement them in a way that the learning opportunities really allow students to meet those goals? How do we ensure teaching expertise, content, and class time, as well as other learning spaces, across this broad range of change agent competencies?

In conventional curricula that focus on disciplinary knowledge and related professional expertise, subject learning and professional learning usually receive most of the class time; the other learning areas are often relegated to the realm of “soft skills” that students are expected to develop “on the side”. Teamwork, for example, is now broadly recognized as an important skill—so students are increasingly asked to work in teams, with more or less instruction, and with the assumption that they will acquire this skill by doing.

Addressing challenge 2
(see beginning of Part 2)

Comparison conventional curricula

Double-loop learning

But competence is not built by experience alone. It requires cognitive and non-cognitive components, e.g. knowledge about competence and related topics as well as application in experiential learning (Barth et al., 2007). And it requires guided and structured reflection in order to develop metacognition and the ability to transfer it through adaptation (Battisti, Passmore, & Sipos, 2008). This approach is characterized in action learning as double-loop learning and seeks to make possible paradigm shifts in the learner so that the reflected experience actually leads to new forms of acting and thinking (Battisti, Passmore, & Sipos, 2008).

Consequently, competence acquisition in each learning area requires teaching and learning, doing, and reflecting. This is a conceptual shift from the conventional educational focus on cognitive, disciplinary knowledge, and it is often a stumbling block in designing this new kind of curriculum. As long as educators and curriculum designers still (unconsciously) prioritize one learning area, rather than consciously understand all learning areas as subjects for a change-agent curriculum, curriculum design will have gaps between desired learning outcomes and actual learning opportunities. Integrating the curriculum dimensions knowing, acting, and being with the learning areas is a useful tool at this juncture to further define the curriculum and actively close gaps in it.

CURRICULUM DIMENSIONS/ LEARNING AREAS	KNOWING	ACTING	BEING
LEARNING AREAS	Which kinds of knowledge need to be engaged? Through which ways of knowing?	Which subject and generic skills need to be engaged? Through which ways of doing?	Which academic, societal, and personal reflections need to be engaged? Through which modes of reflection?
Integrating the learning areas with the curriculum dimensions			
REQUIREMENTS	<p style="text-align: center;">↓</p> Teaching content and class time Instructors with necessary experience	<p style="text-align: center;">↓</p> Application of learning in experiential contexts Coaches with necessary experience	<p style="text-align: center;">↓</p> Appropriate formats and class time for guided, structured reflection Mentors with necessary expertise

Background Box 15 Integrating learning areas with curriculum dimensions

Combining curriculum dimensions and learning areas shows that each area requires class time and instructors with the expertise for necessary inputs; a direct connection with applied learning opportunities where instructors function as coaches; and class time as well as appropriate space for guided, structured reflection. Particularly the reflection part of the curriculum can range from intellectual (reflecting on discourse) to very personal (reflecting on one's own socio-cultural background, personal values, and beliefs). Here it is critical that instructors can take the role as mentors who facilitate a safe and respectful dialog (for more on the different roles of people involved in such a global program, see Part 3).

Class time per learning area

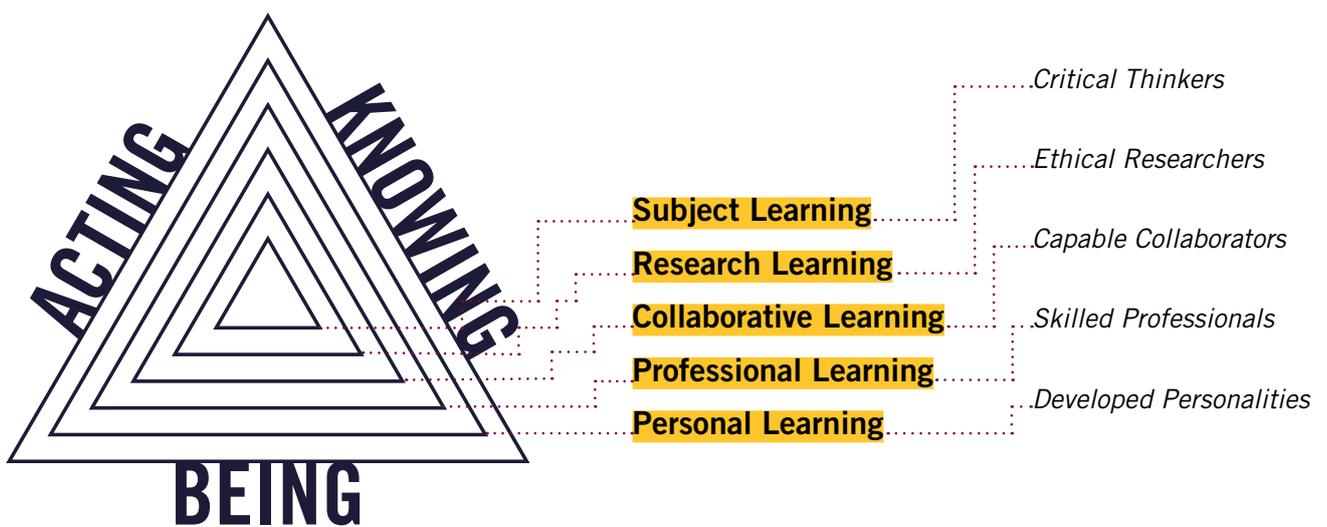
Instructor as mentor

A curriculum design that includes competence-building opportunities in all learning areas will need to:

- Regard content differently: there are more subjects of learning than in conventional curricula
- Distribute time differently, allocating it as needed between the different subjects
- Create different kinds of learning spaces, extending far beyond the cognitive-intellectual.

If this is done successfully, the curriculum actually extends across all necessary learning areas, including all curriculum dimensions, and so enables students to develop across the broad spectrum of competencies and skills related to becoming change agents. In this way, engaging the curriculum dimensions and learning areas can help close potential gaps between desired learning outcomes and the actual curriculum.

Successful integration



Background Box 16 Learning areas in the global curriculum

The Global Classroom Example 10 illustrates our process. For one intended learning outcome per learning area, each curriculum dimension lists what learning opportunities are necessary.

CURRICULUM DIMENSION	INTENDED LEARNING OUTCOMES	KNOWING <i>Which knowledges need to be engaged?</i>	ACTING <i>Which subject and generic skills and competencies need to be built?</i>	BEING <i>Which critical, societal, and personal reflection needs to be engaged?</i>
LEARNING AREA		<i>Through which ways of knowing?</i>	<i>Through which ways of doing?</i>	<i>Through which spaces of reflecting?</i>
Subject learning	Identify sustainability issues in cities; recognize their specific manifestations in different local environments	<p>Concepts, theories, frameworks in Sustainability Science</p> <p>Systems theory</p> <p>Sustainable urban development</p> <p>Interdisciplinarity as practice</p>	<p>Different disciplines in relation to specific issue</p> <p>Exploring sustainability issues locally in own city</p>	<p>Sustainability as discourse and – science in its context of emergence</p> <p>Influence of one’s own values and socio-cultural background on perceiving sustainability issues</p>
Research learning	Design and conduct a solution-oriented research project, with local and transnational elements	<p>Concepts of solution-oriented sustainability research</p> <p>How to design a research project</p> <p>methods in inter- and transdisciplinary research</p>	<p>Conducting a research project</p> <p>Working in inter- and transdisciplinary settings</p> <p>Writing and presenting about the research</p>	<p>Responsibilities as a researcher</p> <p>Role of researcher with respect to participants/ stakeholders</p> <p>Knowledge making as powerful act</p>
Collaborative learning	Work successfully in transnational teams	<p>Elements and best practices/methods of (international) teamwork</p> <p>Diversity and interculturality</p>	<p>Doing work in intercultural teams</p> <p>Actively engaging diversity within team relevant to shared project</p>	<p>different social and cultural contexts</p> <p>Recognizing own communication and work habits</p>



Professional learning	Create and maintain a virtual work environment suitable to the research project and its members	Project management Technologies and software for virtual work environments	Applying and adapting best practices to own specific research project-work environment	One's own role as professional in international environments Professionalization and work in specific cultures
Personal learning	Describe and reflect on one's own values and beliefs	Concepts of identity, culture Self-reflection and peer feedback techniques	Learning-portfolio for all learning areas Written self-reflections	Personal values in context of society, sustainability Participation in civic society, being a change agent

Global Classroom Example 10 Integrated learning areas and curriculum dimensions

2.2.5 How to design your integrated Glocal Curriculum

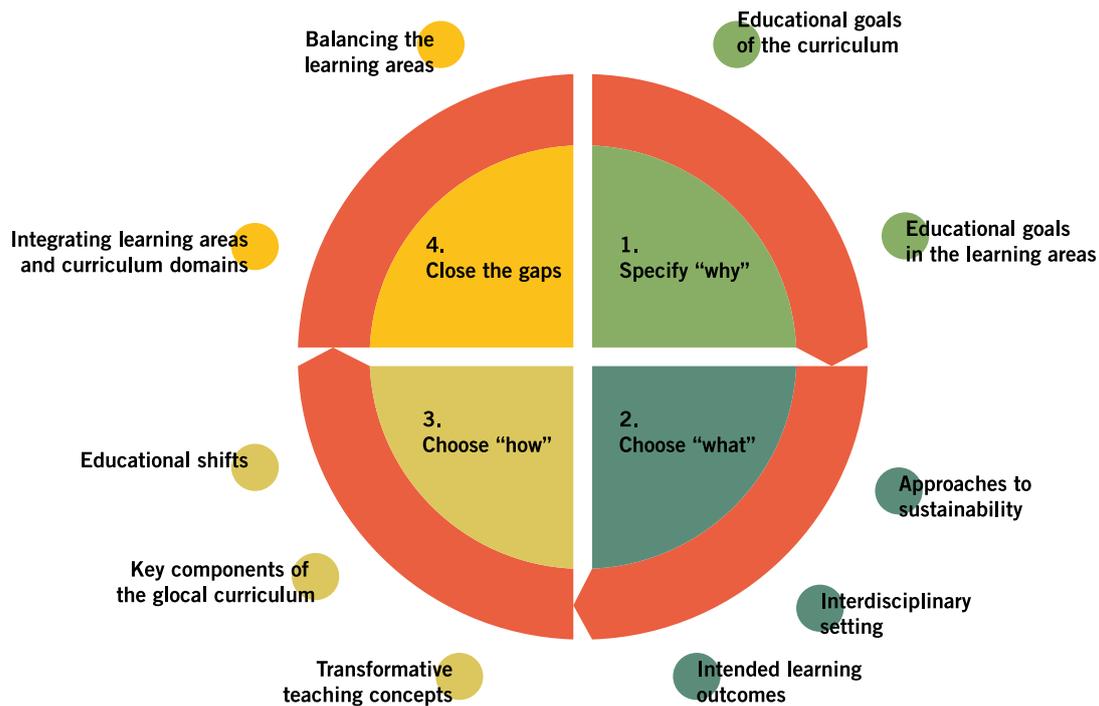


Figure 13 Overview: how to design a glocal curriculum

1 SPECIFYING YOUR "WHY"

This section is meant to support you in specifying your curriculum vision as a first step towards designing a specific curriculum and then a program. The task here is to specify educational goals in the five learning areas that align with the glocal curriculum's focus on *being* a change agent.

- Drawing on the vision you created in Part 1, what are the overarching educational goals of your curriculum?
- What are your more specific educational goals within each learning area?
- How do these goals align with *being* a change agent?

Elaborate on your educational goals within the learning areas. We encourage you to adapt the educational goals of the model curriculum to your needs.

LEARNING AREAS 	WHAT ARE THE EDUCATIONAL GOALS FOR YOUR CURRICULUM IN EACH LEARNING AREA?	EDUCATIONAL GOALS OF THE MODEL CURRICULUM
1. Subject learning: engaging kinds of knowledge		<i>Critical and transformative thinkers</i>
2. Research learning: engaging the world		<i>Productive and ethical researchers</i>
3. Collaborative learning: engaging with others		<i>Capable and empathic collaborators</i>
4. Professional learning: engaging work environments		<i>skilled and motivated professionals</i>
5. Personal learning: engaging the self		<i>Reflective and engaged personalities</i>

Worksheet 7 Defining your educational goals for the learning areas

2 CHOOSING YOUR “WHAT”

Approaches to sustainability competencies: reflection and choices

This section is meant to support you in making the assumptions explicit that the people involved might bring to the process of shared curriculum design, and making the educational philosophies of the participating universities explicit as well as possibly different national educational trends that may influence the curriculum. It can also support you in identifying elements you wish to draw on for your curriculum.

- Which approaches are part of your setting? Which are not? What is the philosophy or attitude of the universities or departments and the team creating this glocal curriculum?
- Which sustainability competence frameworks or models do you want to draw on?

Sustainability as: 	APPROACH IS USED: 0 (NOT AT ALL) TO 5 (COMPLETELY)	Desirable elements or competencies from each approach for your curriculum as of the model curriculum
Educational project		
Professional education		
Problem-solving		
Development project		
Emancipatory project		

Worksheet 8 Exploring your team's approaches to sustainability

Interdisciplinary setting: reflection and choices

This section is meant to support you in making explicit what disciplinary assumptions, cultures, or approaches people may bring to the curriculum design process, as well as making possible disciplinary orientations of the participating universities and departments explicit. It can also support you in identifying disciplinary perspectives you may want or need to include in your curriculum.

- Which disciplines are part of your setting, at the university, at the department, or in the team creating your glocal curriculum? If you already have courses you plan to offer, in which discipline are they located?
- Which disciplinary perspectives will you include in your curriculum?

Criteria for an interdisciplinary curriculum:

- interdisciplinary framing of the curriculum
- participants from different disciplines
- synthesis of disciplinary contributions to foster understanding of the curriculum's topic (rather than different parallel perspectives on it)
- teaching about interdisciplinarity

Fill out the worksheet below: How are the different sciences represented at the participating universities, departments (where the glocal program will be located), and among the participants? Which existing and/or planned courses are located in which discipline? You can adapt it to your needs by specifying the disciplines. It will show you an initial "disciplinary map" and give you a starting point for creating an interdisciplinary curriculum that includes the ecological, social, economic, and cultural perspectives on sustainability.



	UNIVERSITY	DEPARTMENT	Participants in the glocal program team	Courses of the planned curriculum
	Partner 1 Partner 2	Partner 1 Partner 2		
NATURAL SCIENCES				
chemistry, life science, physics...				
HUMANITIES				
philosophy, history, arts...				
SOCIAL SCIENCES				
political science, economics, education...				
FORMAL SCIENCES				
mathematics, statistics...				
APPLIED SCIENCES				
engineering, medicine, IT...				

Worksheet 9 Exploring interdisciplinarity for your curriculum.

Intended learning outcomes: reflection and choices

This section is meant to support you in making explicit the intended learning outcomes for each learning area. Especially in the non-traditional areas, it is useful to ask:

- What kinds of knowledge will students be able to describe, explain, or analyze in this field of expertise?
- What skills will students be able to do, perform, or demonstrate in this field of expertise?
- What attitudes and behaviors might students develop in this field of expertise?

In order to *be* a change agent—a transformative thinker, an empathic collaborator—what would students have to be able to demonstrate? Other important questions to ask while choosing intended learning outcomes are:

- What guides your choices when you specify intended learning outcomes?
- What are your intended learning outcomes in each learning area?
- Do these intended learning outcomes match and operationalize your educational goals?

The worksheet below gives a brief framing of intended learning outcomes of a glocal curriculum for each learning area. Below that, list your intended learning outcomes; you may want to keep to 3-5 key outcomes per learning area.

LEARNING AREAS 	INTENDED LEARNING OUTCOMES: HOW WILL YOUR STUDENTS BE ABLE TO:	EDUCATIONAL GOALS OF
1. Subject learning: engaging kinds of knowledge	Critically engage, situate, and evaluate kinds of knowledge	<i>Critical and transformative thinkers</i>
2. Research learning: engaging the world	Produce meaningful kinds of knowledge ethically, in a mostly self-directed process	<i>Productive and ethical researchers</i>
3. Collaborative learning: engaging with others	Collaborate effectively and equitably in different settings with different participants	<i>Capable and empathic collaborators</i>
4. Professional learning: engaging work environments	Successfully participate and facilitate the participation of others in different work environments, in particular transnational ones	<i>Skilled and motivated professionals</i>
5. Personal learning: engaging the self	Engage personal backgrounds, worldviews, and values in relation to learning, and develop active citizenship	<i>Reflective and engaged personalities</i>

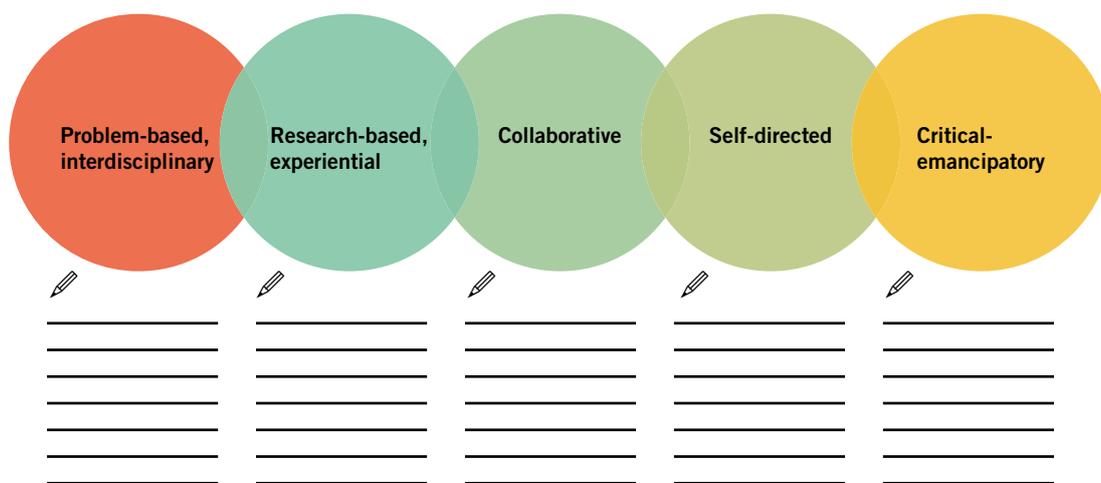
Worksheet 10 Defining your intended learning outcomes in the learning areas

3 CHOOSING “HOW”: TRANSFORMATIVE TEACHING CONCEPTS

This section is meant to support you in choosing the appropriate transformative teaching concepts, as well as settings and pedagogies in and through which teaching your glocal curriculum will take place. It also helps you to assess more specifically which teaching concepts might be needed for the learning areas, as well as checking on how you engage with the educational shifts that are part of the glocal curriculum.

Key components of teaching the glocal curriculum

- Which transformative teaching concepts are aligned with the curriculum vision you developed in Part 1?
- How do your chosen concepts represent the five key components of teaching the glocal curriculum?
 - How and in which setting will you teach students to employ a problem-based and interdisciplinary approach to your curriculum’s topic?
 - How and in which setting will you teach students to produce actionable knowledge on real-world issues?
 - How and in which setting will you teach students to collaborate and facilitate collaboration?
 - How and in which setting will you teach students to become self-directed learners, researchers, and citizens?
 - How and in which setting will you teach students to develop critical literacy and normative competence?



Worksheet 11 Filling the key components for teaching your curriculum

Transformative teaching concepts in the learning areas

This section is meant to support you in assessing more specifically what kind of teaching concepts you may need to employ in order to provide the learning opportunities that lead to your intended learning outcomes. Thinking through each learning area can help you identify and close gaps. Some teaching concepts may be suitable to one or more learning areas, while other areas may need different concepts or additional training opportunities.

Most universities already have experience with some of these concepts—maybe a service-learning tradition or a record of transdisciplinary research projects. If you can draw on such resources, check what you may need to add to create a full glocal curriculum.

- Which transformative teaching concepts will help your students to achieve the intended learning outcomes of your curriculum?
- What experiences or resources do the participating universities have with such teaching concepts? What would work for both, and where can the partners complement each other?

In the following worksheet, enter the intended learning outcomes you chose in Section 2 above and the teaching concepts you intend to employ. You can discuss the key questions in your team and explore what works for the glocal curriculum as well as for the participating universities and teams.

INTENDED LEARNING OUTCOMES	TRANSFORMATIVE TEACHING CONCEPTS	EXPERIENCES AND RESOURCES
		
1. Subject learning		
2. Research learning		
3. Collaborative learning		
4. Professional learning		
5. Personal learning		

Educational shifts

Where do you locate your curriculum with respect to the educational shifts that a global curriculum needs to take into account? If you end up far on the left side on any of the scales below, you may want to reconsider these teaching concepts.

A FROM PREDOMINANTLY	WHERE DO YOU SEE YOUR CURRICULUM? A-----EQUALLY-----B	B TO ALSO INCLUDE...
		
Disciplinary		Inter- and transdisciplinary
Reproducing knowledge		Knowledge-making
Teacher centered		Student centered
Individual competitive learning		Collaborative, synergetic learning
Profession specific		Transferable professional skills
Focused on cognitive learning		Integrating "head, hands, and heart"

Worksheet 13 Positioning your teaching in the educational shifts of a global curriculum

4 CLOSING THE GAPS

This section is meant to support you in assessing whether your chosen teaching concepts and settings actually provide the learning opportunities needed to achieve the intended learning outcomes in all of the learning areas you have defined.

- How are the curriculum dimensions knowing, acting, and being realized in your curriculum? How do you engage "head, hands, and heart"?

- How are the three curriculum dimensions present in each learning area? Do students get the relevant kinds of knowledge (and ways of knowing), as well as experience (ways of acting) and critical reflections and affective engagement (ways of being) in each?
 - Pay particular attention to learning areas 3-5, which often leave out *knowing*
 - Pay particular attention to *being*, which is often neglected across the curriculum
- Are there actual learning opportunities for all intended learning outcomes?
- Are the learning areas well balanced? Does each area provide the learning opportunities necessary for your curriculum, in reasonable relation to the main task you will set your students?

You can use the worksheet below to explore your own curriculum. In each learning area, enter your intended learning outcomes (left) and your chosen teaching concepts (right). Then look at the intended learning outcomes through the lenses of the three curriculum dimensions:

- a. Knowing: Which kinds of knowledge need to be engaged? Which content and input will you need to provide to enable the intended learning outcomes?
- b. Acting: Which subject-specific and generic or transferable skills and competencies need to be developed? Which experiential learning opportunities will you need to provide in order to enable the intended learning outcomes?
- c. Being: Which critical, societal, and personal reflections need to be engaged? Which attitudes may you want to encourage? Which structured reflection formats will you need to provide in order to enable the intended learning outcomes?

Especially in the non-traditional areas such as collaborative learning, you may find gaps. If students are provided with the opportunity to collaborate in teams (b), are they also provided with the kinds of knowledge and information (a) they will need to learn about how to do this well? If they have the opportunity to work in transnational teams (b), will they get to learn about intercultural and diversity competence (a)? And which specific learning opportunities will they get to critically reflect on these inputs and experiences, and develop an understanding of themselves as “capable and empathic collaborators” (c)?

This step is a “checkup” you may need to perform more than once – for example, after defining modules (Section 2.3.1) and after putting together courses (Section 2.3.2) are useful moments to check again whether students actually get the opportunities they need to achieve the intended learning outcomes. Once you fill it out, this worksheet can also assist you in putting together the teaching team that will be able to provide the needed learning opportunities (Section 2.3.3).

**INTENDED
LEARNING
OUTCOMES****(a) Knowing****(b) Acting****(c) Being****Teaching
concepts**

	INTENDED LEARNING OUTCOMES	(a) Knowing	(b) Acting	(c) Being	Teaching concepts
1 Subject					
2 Research					
3 Collaborative					
4 Professional					
5 Personal					

Worksheet 14 Closing gaps: integrating your learning areas and curriculum dimensions

2.2.6 Further Reading

ON HIGHER EDUCATION FOR SUSTAINABLE DEVELOPMENT AND KEY DEBATES

Barth, M. (2015). *Implementing Sustainability in Higher Education: Learning in an age of transformation*. Routledge, New York and London.

Jickling, B. & Wals, A. E. J. (2008). Globalization and environmental education: looking beyond sustainable development. *Journal of Curriculum Studies*, 40 (1), 1–21.

Klinsky, S., & Golub, A. (2016). Justice and Sustainability. In Heinrichs, H., Martens, P., Michelsen, G., & Wiek, A. (Ed.) (2016). *Sustainability Science*. (pp. 161–173). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-94-017-7242-6_14

ON COMPETENCIES FOR SUSTAINABILITY

Rychen, D. S. & Salganik, L. H. (Eds.). (2003). *Key Kompetencies for a Successful Life and a Well-Functioning Society*. Hogrefe & Huber, Cambridge, MA.

Wiek, A., Withycombe, L. & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6(2), 203–218. doi:10.1007/s11625-011-0132-6

ON REAL-WORLD LEARNING AND KNOWLEDGE MAKING

Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: from classroom into the real world. *International Journal of Sustainability in Higher Education*, 11(4), 308–324. doi:10.1108/14676371011077540

Sipos, Y., Battisti, B. & Grimm, K. (2008). Achieving transformative sustainability learning: engaging head, hands and heart. *International Journal of Sustainability in Higher Education*, 9(1), 68–86. doi:10.1108/14676370810842193

2.3 PROGRAM DESIGN: DETERMINING “WHEN”, “WHERE”, AND “WHO”

Change through curriculum reform	Program design specifies which courses can be taken and in which sequence so that the requirements of the curriculum are fulfilled. In a glocal curriculum, the combination of the learning areas with transformative teaching concepts needs to be taken into consideration to answer the question “where”? That is, in which courses or settings will this particular learning take place? Often, sustainability programs incorporate existing courses and/or develop existing programs further. This is not only a pragmatic strategy to save resources, it is also a means of initiating institutional change through curriculum reform by integrating sustainability—along with different forms of teaching and learning—into existing curricula, rather than focusing solely on the design of new courses and programs of study (Barth, 2015). Whether you build on or are reforming an existing program, or whether you are designing a new program with new courses, there are six elements that will help you translate the curriculum into a program that truly reflects your vision: scope, sequence, continuity, integration, articulation, and balance (O’Neill, 2015, p. 48). Balance and scope will be addressed in the following paragraphs.
Six elements of a program	
Definition of balance	Balance refers to the importance of balancing knowing, being, and acting in the glocal curriculum (Barnett, Parry, & Coate, 2001). Similar concepts in use are balancing the cognitive, psychomotor, and affective domains of learning, or head, hands, and heart (Sipos et al., 2008). The need for this has been addressed in Part 1, and pathways to doing so in the section above, “Closing the Gaps”.
Definition of scope	<p>Scope refers to curriculum content. Sustainability is a field with great breadth and depth and a wealth of information. When moving from the educational goals and intended learning outcomes of the curriculum to the specifics of a program, a major challenge is reducing the amount of available information and learning activities in a way that retains enough depth in learning to be still meaningful. The glocal curriculum narrows focus without narrowing its vision through two choices:</p> <ul style="list-style-type: none">• The particular sustainability topic in the glocal curriculum (in our case, “Sustainable Cities”); this topic is chosen by the program leaders and/or curriculum designers.• The individual subtopics researched by the students in depth. These research topics are chosen by the students together with their instructors to ensure do-ability as well as utilize connections to the instructors’ current research interests.
Sustainability as evolving concept	In this way, sustainability as discourse and an area of societal action, as well as sustainability as an academic field, are introduced and discussed as evolving and contested concepts, but then explored in depth through very specific topics. Students explore different subtopics in depth and continuously exchange their findings and emerging questions in plenary sessions. These reconnect the groups, allowing for greater breadth of understanding without shallowness. Student engagement is increased by their taking the roles of expert and reporter of their findings, and so becoming teachers to the other students as well as critical listeners.

One of the most critical constraining factors in designing a glocal program is time, both in terms of the courses in a program and the learning activities in a course. It can easily lead to dropping content relevant for a glocal curriculum in favor of what the curriculum designers and participating instructors might otherwise prioritize. Therefore, the following sections use the model of the learning areas to help make the translation from curriculum to program design and preserve the scope of the curriculum within the limits of the program.

Time restrictions

2.3.1 “When”: Organizing Learning over Time

The program has a temporal dimension in that learning opportunities have to be organized in a meaningful sequence. In a problem-based learning approach, this is reflected in a whole-to-part sequence. Other ways to create sequence in curriculum design are simple-to-complex, basic-to-advanced, or chronological learning (O’Neill, 2015, p. 49). A characteristic of the glocal curriculum is that students begin to engage complex problems very early on, rather than going through a prolonged period of basic-to-advanced theoretical learning before beginning to apply the learning. This reflects the demand-oriented approach to competence (Rychen & Salganic, 2003), in which the learning setting, for example a research project, demands certain competencies and skills of the students. At the same time, since students work in a largely self-directed manner, they demand information they need for their work; an approach that supports processing and retention of content (Barth, 2015).

Sequence of learning opportunities

Demand orientation

The following is the sequence of elements for a glocal curriculum:

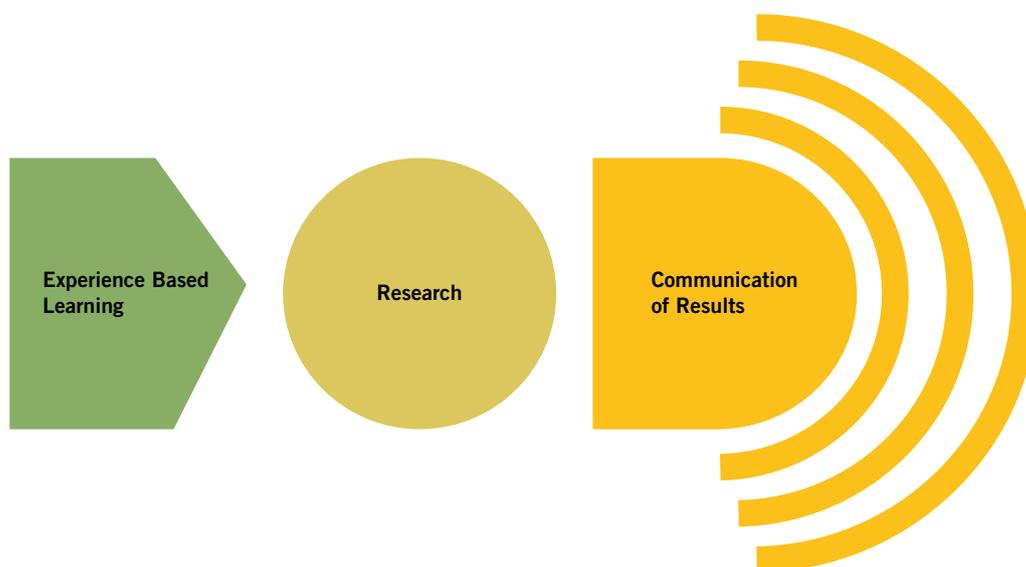


Figure 14 Sequence of elements in the glocal curriculum

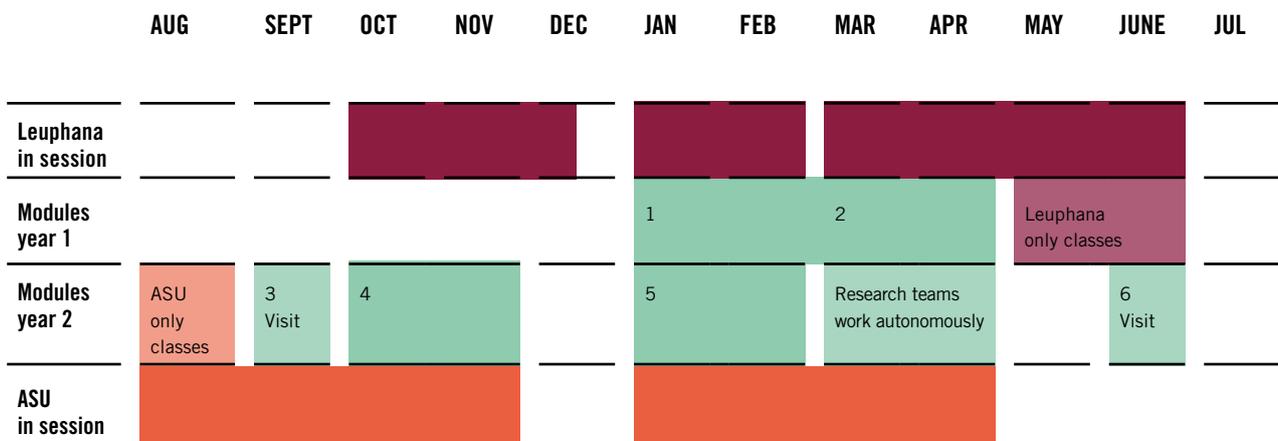
Experience-based learning Experience-based learning allows students to connect their prior experience and their local environment to the sustainability topics in the glocal curriculum. This can be done for example through exploring how the topic of the glocal curriculum can be found in the physical environment around the university as well as in the home environments of the students. It is also a method to enable development of basic sustainability competencies (Caniglia et al., 2016). The research project—when students produce knowledge about a real-world issue—is a major part of the program, and determines much of its rhythm. The communication of results to those who have participated in the research project as well as to other stakeholder is an essential component of a change agent with glocal curriculum: work is not produced for grades alone.

Student research projects

MODULAR STRUCTURE OF THE GLOCAL CURRICULUM

Modules as units of time Programs are usually structured in time by academic semesters. The glocal curriculum sequence is structured also in modules: units of time that have a particular learning outcome, which is achieved through the learning activities done over its duration. You can think of the three elements of sequence above as the first level of modularization.

In contrast to semester courses For a transnational program, the “when” dimension of the curriculum presents a particular challenge as academic calendars may not be aligned and semesters only partly overlap. Structuring the curriculum in modules as units of learning in time that are shorter than a whole semester has proven to be a helpful tool to accommodate these differences. A module may take place in the summer term at one university and in the fall term at the other (and count towards those grades) and still have students from both universities participating in the same activities and fulfilling the same requirements. See below Global Classroom Example 11: Modules 1 & 2 are “Experience-based learning”, Modules 3-5 are “Research” (with Module 3 done together at ASU), and Module 6 is “Communicating research”, done together at Leuphana and Arizona State University.



Global Classroom Example 11 Modules as units of learning in time for two academic calendars

The “when” dimension of the curriculum, and therefore its modules, also include the concepts of continuity and integration.

Continuity refers to the repetition of major curriculum elements in different modules over time. It is important to identify the themes or skills that need to run through a program and to map how they will be addressed at each level (O’Neill 2015). Demand for knowledge and competencies, as well as opportunities to revisit key learning outcomes on higher levels, reinforces learning and prompts students to engage in the process of learning transfer by actively adapting it to new contexts and levels of challenge. In the glocal curriculum, the learning areas are themes that run through the program and are addressed at increasing levels of complexity creating new demands on the knowledge, competence, and skills of students.

Continuity

Below is a sample for continuity in each learning area:

- Subject learning deepens kinds of knowledge about the class topics.
- Research learning progresses through the stages of question, design, collect, analyze, communicate, and evaluate in the research project.
- Collaborative learning moves through stages of the research team’s lifecycle; develops relationships and ways of working together, and meets challenges.
- Professional learning increases professional skills in different situations.
- Personal learning increases depth of personal engagement with the educational goals, topics, materials, processes, and relationships.

Integration refers to the relationship among major curriculum components at any point in time. Integration fosters reinforcement of key learning and is needed to promote application of learning across course boundaries (O’Neill, 2015). In a glocal curriculum, integration refers to aligning the learning areas in a meaningful way. For the learning outcome of each module, we need to consider what kinds of knowledge and learning opportunities the students need in each learning area in order to succeed. Here, we distribute the intended learning outcomes for each learning area over time in such a way that students get what they need when they need it. The immediate connection of learning with application—for example in the research project or team building process—fosters retention and reflection.

Integration

TIMING FOR TEAMWORK INPUTS

We gave a general introduction to teamwork at the beginning of the program when there was time for the unit. When actual teamwork started six months later, students reported that they hadn’t been able to

make much sense of the inputs at the time and forgot to draw on them when the teamwork began and they needed the information. Consequently, we adapted the curriculum to provide continuous specific inputs about good teamwork practices in direct connection with actual team tasks during the research project.

Global Classroom Example 12 Timing for teamwork inputs

2.3.2 “Where”: Defining Program Components

After you have defined the modules and their sequence and have aligned the learning opportunities with the intended learning outcomes of your curriculum, you may want to analyze where these learning opportunities should take place. Will they be in existing courses or new ones you are designing? This can be done by comparing your intended learning outcomes and the teaching concepts (since both are integral components of the learning opportunity) to the planned courses. You can assess what you already have or may need in terms of *where = learning space + time*, and then ask how much this space already incorporates the teaching concepts, or where you may want to make adjustments.

Existing and new learning opportunities

WHAT

Intended learning outcomes for each learning area

Example:

Describe and apply disciplinary, inter- and transdisciplinary research methods

WHERE

Is there a specific module where this learning can happen?

Example:

A research methods course

Are there specific learning activities within the module?

Example:

Classes on inter- and transdisciplinary methods

HOW

How do the courses and learning activities embody the teaching concepts?

Example:

Inter- and transdisciplinary learning with instructors and experts with different disciplinary perspectives, addressing one problem together

Background Box 17 Exploring “where”: program components

A pitfall at this step lies in assuming that employing a transformative teaching concept, such as project and problem-based learning, will automatically lead to the learning opportunities needed to build competencies in all learning areas. In assessing the “where”, however, it is likely that you will find significant gaps, often as a result of more traditional conceptions of the curriculum. For example, the subject learning area (whether disciplinary or interdisciplinary) is likely to already have significantly more space than collaborative learning. Building a glocal curriculum for change agents from the ground up helps designers give new prominence to areas previously marginalized for institutional or pragmatic reasons. For example, space is given to what was previously considered just soft skills, and considerable preparation goes into changing to a teaching methodology that integrates personal perspectives into research. Designing a glocal cur

Gaps through traditional conceptions

Value of program design
for institutions

riculum encourages an interactive process between the realities of the particular context—institutional, departmental, or the program itself—and the needs of a glocal curriculum. There will certainly be limits and trade-offs, but ones that are carefully negotiated, and they might elicit reflection on what educational institutions have come to accept as their boundaries. And maybe such negotiations will also lead to proposals for new programs and resources. Program design can be an important part of institutional change, from mindsets to budgets; and it can be a process that “invites critical questions about education’s purposes, practices, and underlying assumptions, and in so doing reanimates core values” (Boose & Hutchings, 2016, p. 1). It is definitely a considerable challenge to transfer the glocal curriculum to a program, but one well worth taking on.

2.3.3 “Who”: Mapping Expertise and the Teaching Team

Since the glocal curriculum has more subjects than usual, and recognizes these as necessary areas of learning with their own intended learning outcomes, implementing this curriculum also requires more expertise. Instructors are usually experts in their disciplinary subject and in teaching in the classroom and lecture hall. In a glocal curriculum, instructors engage with topic areas outside their research areas. They also perform functions such as virtual-learning facilitator and team coach that are beyond the normal scope of an instructor’s tasks. Therefore, more competencies than usually required are asked of instructors (Vogt, Bellina, & John, 2016) on two levels:

TRANSFORMATIVE TEACHING IN THE GLOCAL CURRICULUM

Competencies for
instructors

- Inter- and transdisciplinarity competence
- Intercultural competence
- Diversity competence
- Media competence, including critical media literacy
- Technological skills, including facilitating virtual and blended learning environments
- Moderation skills in local, team-based, and virtual learning environments
- Coaching competence—acting as a facilitator rather than as a “teacher” as well as coaching product (research) as well as process (team)
- Teamwork and project management skills and competences

TEACHING THESE COMPETENCIES

Employ and teach

Instructors in a glocal program have to employ these competencies and teach them. This, however, poses its own challenges. An obvious example is intercultural competence, a field of expertise with its own theoretical concepts, areas of application, and pedagogies. A high degree of expertise and teaching experience in this competence area cannot be expected of all instructors.

We also need to consider that a glocal curriculum engages real-world issues, which requires expertise in interdisciplinary work as well as teaching interdisciplinarity as a research method. Some programs invite societal experts and practitioners to take part in the program, which requires teaching transdisciplinary research. In addition, such research may engage non-academic kinds of knowledge, such as community-based knowledge. Understanding these kinds of knowledge and applying them in context is another area of expertise needed by instructors in a glocal program.

HOW DO WE DEAL WITH THIS IN PROGRAM PLANNING?

A good option is doing curriculum design as a team and exploring together what it takes to implement such a curriculum. There may be surprising insights into the wealth of expertise and competencies (beyond the obvious disciplinary) already present among the participants. But it also requires stepping outside of the traditional paradigm of the professor the expert, and openness to admitting where one doesn't have expertise—and a willingness to learn from each other. In the glocal curriculum, we ask students to engage in collaborative learning, acknowledging each other as both learners and teachers. The same goes for instructors in the glocal curriculum. They need to embody this principle of life-long-learning and their multiple situatedness as both experts and learners. Here, participating in a glocal program also offers a great advantage: opportunities for exchange and peer learning for instructors.

Instructors as learners

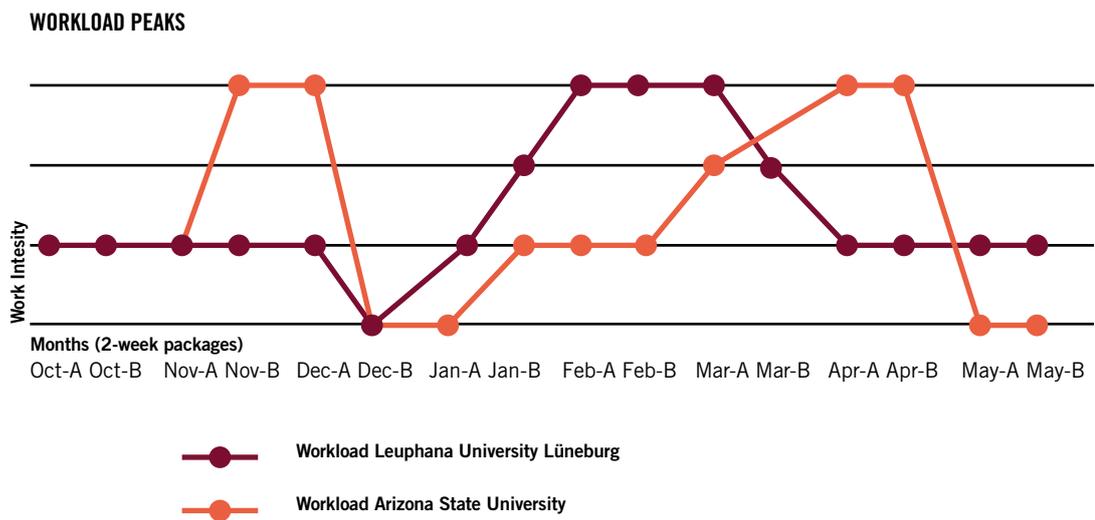
A second, and necessary, pathway is making use of external resources. Does the university have a methods center, where experts on, for example, teamwork and project management are available to come to classes to teach? Are there experts on diversity or intercultural competence at the university who are able to train students as well as instructors? Are there experts from outside the university who could be part of the program as professors of practice?

External resources

Assessing the “who” can be just as challenging as assessing the “where”. It reveals how existing structures, courses, and faculty may not yet be able to implement a glocal curriculum. How can we work within existing limitations without being bound by them? What avenues do we have to bring outside experts into the program, rather than returning to traditional priorities and reducing important elements in the curriculum to optional add-ons?

2.3.4 Challenges in a Glocal Program

An important consideration in addressing “when” in transnational programs is the student workload. Each academic calendar has its own rhythm and places different demands on students (such as exam times or other degree requirements) at different times. If students are to successfully work together as a transnational team, these differences need to be completely transparent in order to avoid a conflict of schedules. The same of course goes for the instructors. If they are to be fully available in the glocal program when they are needed, their academic schedules and other demands on their time need to be taken into account.



Global Classroom Example 14 Workload peaks between partner universities

Grading requirements and exam periods.

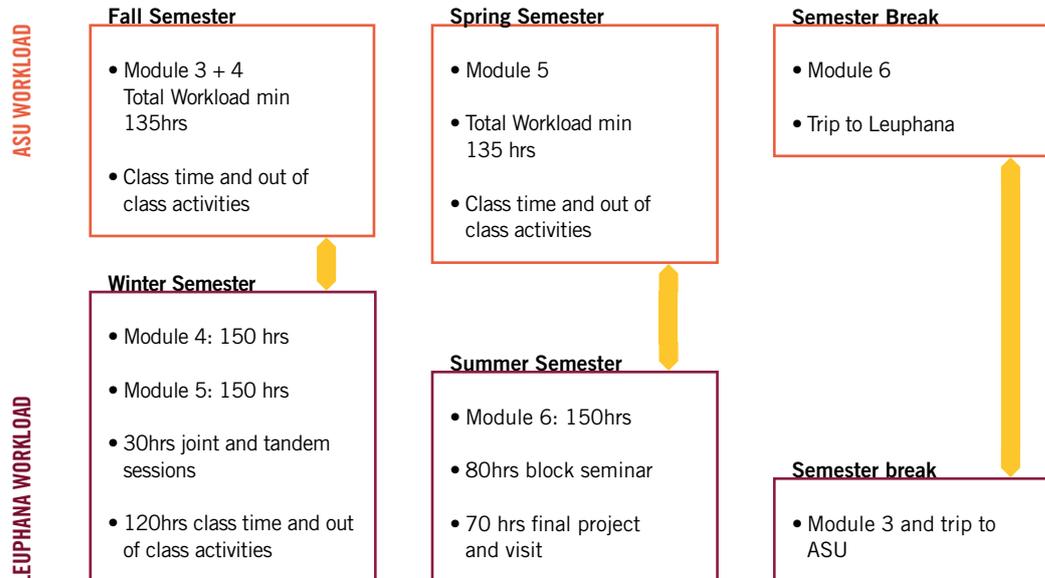
Workload peaks are often related to grading requirements and exam periods. Especially if the glocal program is taken as a minor, students will have other demands on their time that will influence their ability to produce work for the glocal program and collaborate with each other. It is crucial that these demands are made explicit during program planning and taken into account, otherwise, conflicts in the student teams are to be expected over at times unequal contributions to the shared project. At the same time, this is a learning opportunity in regards to professional international work environments as students learn time management, in particular to articulate differences in local availabilities clearly, and account for their own work schedules in their team's project plan.

Coordinating requirements

But even when the glocal curriculum is taken as a major or full program of study, assessment requirements and due dates will most likely differ between the participating universities. The modular structure can help: by designing the deliverables and assessments for each module so that they provide the necessary grades towards each university's requirements at the time they are needed, rather than aiming for one final semester grade at the same time for all students. For example, at one university the spring semester grade is calculated based on Modules 1 and 2, while at the other the summer semester grade is calculated based on the grades for Modules 2 and 3.

Credit points and workload

If there is a difference in the number of credit points awarded per module by the partner universities, this will also translate to a difference in the workload. There also needs to be transparency about this too. Below is an example of a simple way of depicting such a situation.



Global Classroom Example 15 Differences in workloads between partner universities.

This leads to the final element of program design as outlined above, articulation. This is the “need in a programme to articulate the horizontal and vertical relationship of a programme to the various stakeholders” (O’Neill, 2015, p. 55). In a glocal program, involving two or more universities in different countries, the “articulation” of program design is of paramount importance. Administrators, both core and guest lecturers, as well as students, all need to know precisely what is happening and when. On an organizational level, differences in academic calendars and workload need to be specified. But also educational goals, learning outcomes and the sequence of learning activities, as well as deliverables need to be clear to everyone involved. A manual given to everyone in the program proved to be very helpful in our Global Classroom, as it supported student learning and satisfaction as well as the willingness of instructors to participate in such a complex project.

Articulation

In sum, a glocal curriculum can be adapted to different academic calendars and workloads by structuring it in modules as units of learning that are shorter than the semester and that have their own deliverables and assessment schedules. This ensures continuity of the glocal curriculum despite differences between the partner universities regarding the times when classes are in session as well as when grades are due. And it accounts for the complexity of a curriculum for change agent sby designing the modules as units of meaning that integrate the different learning areas. This helps us avoid what students in conventional curricula often experience as relatively disconnected classes on different topics, where it is up to them to make meaningful connections between the learning activities, and instead create a more integrated educational experience.

Adaptation and more coherence

2.3.5 How to Design a Glocal Program

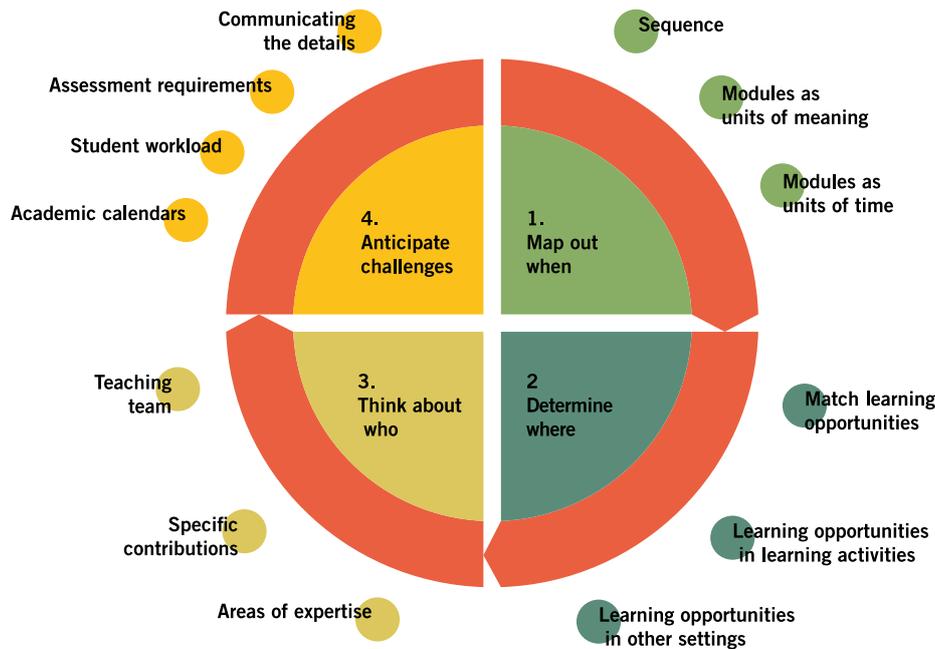


Figure 15 Overview: how to design a glocal program

1) MAPPING OUT “WHEN”

This section is meant to support you in mapping out the sequence of your curriculum components. Like in planning a movie, you can make a “storyboard” of your curriculum. It provides the sequence of “sets”, e.g. learning settings, it helps to determine the order of activities in the learning areas, so that these are aligned with the modules’ tasks. You can then also use this storyboard to determine when you will need who—experts for specific inputs for example—in which settings.

- Sequence: How does your curriculum integrate the sequence: experience-based learning, research, and communication of results? What are the main learning activities you are planning for each part?
- What are the units of meaning (e.g. modules) in your curriculum along this sequence? What is the “story” of the curriculum?
 - What are key activities of your modules?
 - What is the overarching topic/goal of each module?
 - Is there a particular main activity (such as a stage of research) during that time?

2) DETERMINING “WHERE”

This section is meant to support you in assessing where you already have, or are already planning, learning space and time for all the elements of your curriculum. It is particularly useful if you are using existing courses and need to adapt these to the multiple subjects and transformative teaching concepts of a glocal curriculum. It may also highlight where the participating universities already have learning opportunities in place that the other partners can take part in, rather than creating their own.

- In which settings—whether courses, particular learning activities, or other settings such as fieldwork—will the learning take place?
- Do these settings align with both the intended learning outcomes and the transformative teaching concepts? Does “what” is taught and “how” it is engaged align with glocal curriculum requirements?
- Which learning opportunities and/or forms of teaching might you need to add?

In the worksheet below, first list your intended learning outcomes for the learning areas (the “what”). Then locate the learning opportunities for achieving the learning outcomes in either a specific course or, if there is no specific course, in learning activities or other settings (for example: coaching sessions with the research teams). Finally, specify how the settings, courses, or learning activities embody the transformative teaching concepts of a curriculum for change agents. The ones listed under “how” are meant as a reminder of key components and do not list each relevant concept in each area. Please expand as needed.

What are the intended learning outcomes?	Where are the necessary learning opportunities located?		How do the settings, courses or learning activities embody the transformative teaching concepts?
	Is there a specific course?	Are there learning activities within courses? Other settings?	
1. Subject learning			Problem-based interdisciplinary learning; multi-perspectival and multimodal; developing critical discourse literacy
2. Research learning			Inter- and possibly transdisciplinary research-based; experiential learning; self-directed learning



3. Collaborative learning			Collaborative, synergetic learning; including diversity & intercultural competencies
4. Professional learning			Building relevant and transferable professional skills without instrumentalizing education
5. Personal learning			Action learning including structured reflection; peer learning; critical emancipatory learning

Worksheet 16 Exploring where: program components

3) THINKING ABOUT “WHO”

This section is meant to support you in thinking about who you might need as main instructors, guest lecturers, or external experts in order to teach the wide range of learning subjects, competencies, and skills of a glocal curriculum.

- Which areas of expertise are needed to implement your curriculum? Which kinds of knowledge, skills, competencies, and teaching experiences are required to provide the necessary learning opportunities in all learning areas?

You can use the Worksheet 16 in point 2 above: “Mapping when”, and use the key learning outcomes and activities as a guide.

- Which forms of expertise and competencies are general teaching requirements, meaning that all participating instructors need them? What will all instructors do?

You can write job descriptions for instructors in this particular program. Example: “All participating instructors need to have an understanding of interdisciplinarity as theory and practice...”

- Which forms of expertise can be specific contributions by individual instructors? What are particular areas of expertise that cannot reasonably be expected of all instructors?

Write job descriptions for these contributors. Example: “One instructor needs to be able to teach teamwork and team processes to both students and instructors as well as design teamwork assignments and coach teams in applying what they learn about collaboration.”

- What is the ideal teaching team your program would need?

If you are putting together a new team, this can help you choose the right participants. If you are working with an existing team, this can help you assess what the team already brings to the table—who fills which job descriptions—and where you may need external resources. In most cases, a combination of discovering existing competence sets, teaching each other, and adding new team

members and/or external experts will enable you to cover the broad range of expertise a glocal curriculum requires.

4) DEALING WITH CHALLENGES

This section is meant to support you in anticipating some key challenges of program design for a glocal curriculum. It covers by no means all of them. Administrative issues, for example, will be different in each particular university collaboration project. The ones we chose here have particular stumbling-block potential; addressing them early will greatly enhance student and instructor satisfaction (and prevent frustration).

Academic calendars

- How much do your semesters overlap?
 - Map your program's modules onto the academic calendars of the participating universities. Where do they overlap?
 - Are there components of the modules that do not need to be done at the same time and which you can map onto those parts of the semester that do not overlap?
 - Do students need to work together in their teams at times that are outside one or the other university's semester? Times during semester breaks?
- Is there a time change (daylight saving time) during the shared program time? Is this the case in both countries, and if so is it at the same time? If not, how will you account for class time now being out of sync?

Student workload

When can the students expect workload peaks in the glocal program, and in their majors? Are there particular exam times that will lead to increased workload or decreased availability of students and/or instructors?

Assessment requirements and due dates

What are the assessment requirements and due dates for grades at the participating universities? Are there substantial differences? (Example: does one university grade student participation or attendance, while the other doesn't?)

- Map the grade due dates onto the academic calendars and subsequently into the modules. How does this affect a module's student deliverables?

Credit points and expected work hours

Are there differences in credit points and expected workload between the universities? How will you take these into account during your modules?

Communicating the details of the program

How will you communicate the participating universities' different calendars, expectations, etc. to everyone involved? We did this using a Global Classroom Manual (see below for the table of contents).

COMMUNICATING THE PROGRAM IN A HANDBOOK

1. Module descriptions: learning outcomes, main tasks, main learning activities
2. Teams and their instructors; coaching structure
3. Shared (virtual) and local sessions; timeline for each university's semester
4. Milestones and final products
5. Academic calendars and workload
6. Summer and winter time changes
7. Grading: university A, university B: requirements, assessment, due dates
8. Job descriptions for students and instructors in the research process

Global Classroom Example 16 Communicating the program in a handbook

2.3.6 Further Reading

O'Neill, G. (2015). *Curriculum Design in Higher Education: Theory To Practice*. Dublin: UCD Teaching & Learning.

Huber, M. T., & Hutchings, P. (2004). *Integrative Learning: Mapping the Terrain Strategies*. Washington DC: Association of American Colleges and Universities.

Adams, M., Bell, L. A., & Griffin, P. (2007). *Teaching for diversity and social justice*. New York.

de Kraker, J., Lansu, A., & van Dam-Mieras, R. (2007). *Crossing Boundaries. Innovative Learning for Sustainable Development in Higher Education*. VAS, Frankfurt am Main, Germany.

2.4 SCALING UP AND DOWN

Course The glocal curriculum model can be scaled up or down, from a single course to a minor to a full program of study. A single course can be co-designed and taught by two universities and embody the educational goals and transformative teaching of a glocal curriculum, even though the scope of content and settings will have to be carefully adjusted to make it doable for both students and instructors. A minor offers more possibilities, yet faces challenges in coordinating the workload so it is not overwhelming for students taking a different major. A full program of study has more control of the design and implementation of a glocal program, but it also requires much more extensive coordination of administrative and legal issues as well as attending to the challenges of long-term, large-scale international collaboration efforts. Each level of scale has its opportunities and limitations, however, the main elements of glocal teaching and learning remain the same on each level of scale:

- Consistent elements**
- a. the curriculum dimensions: knowing, acting, and being
 - b. the learning areas: subject, research, collaborative, professional, and personal
 - c. and the teaching-learning environment: space, place, and people

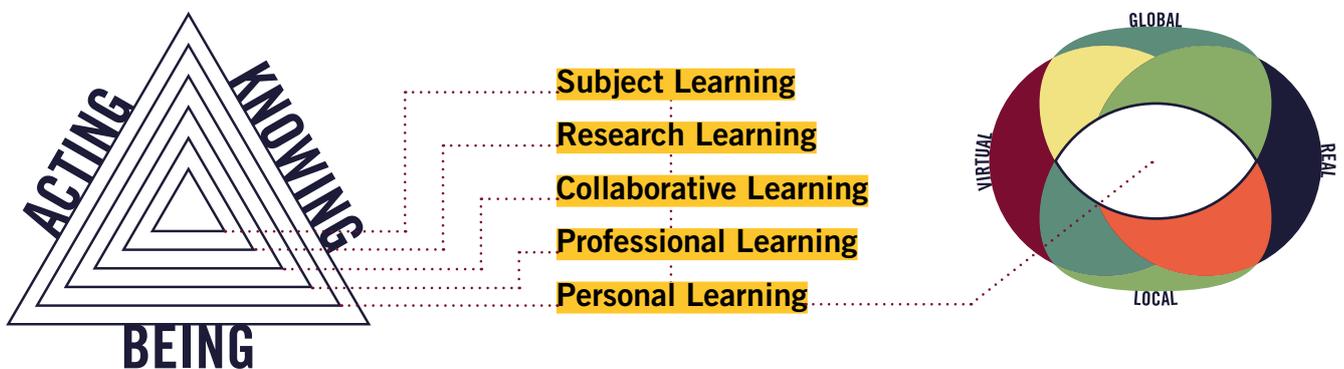


Figure 16 The main elements of glocal teaching and learning

The other elements of the glocal curriculum that remain the same across scale are:

Consistent elements

1. the key components of teaching the glocal curriculum:
 - problem-based, interdisciplinary
 - research-based, experiential
 - collaborative
 - self-directed
 - critical emancipatory
2. the sequence of the glocal curriculum:
 - first, experience-based learning, then research, and eventually communication of results

The key to scaling a glocal curriculum is to keep its main constituting elements while adjusting the scope they can have in a specific module, minor, or program of study.

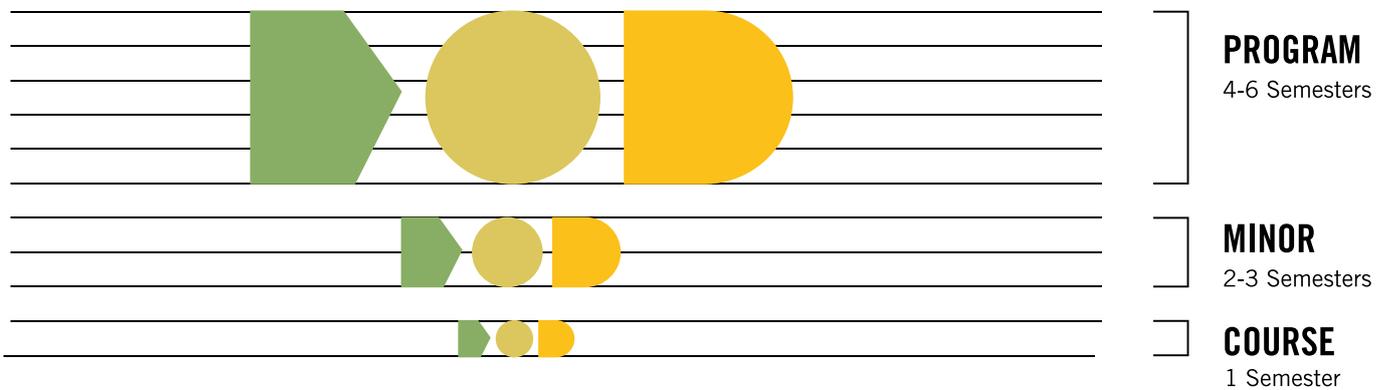


Figure 17 Scaling the glocal curriculum

2.4.1 How to Adapt your Glocal Curriculum to Different Scales



Figure 18 Overview: how to scale the curriculum

On each scale, the steps of curriculum and program design can be applied to create a course, minor, or major that embodies the glocal curriculum. Below you find a set of key questions regarding scale along the design steps.

Learning Areas

- How are the five different areas of learning present in the course, minor, or program? What are scale-appropriate settings and choices for:
 - Subject learning: how can interdisciplinarity be practiced by the main participating instructors? Through guest lecturers? Through materials?
 - Research learning: what is a real-world issue students can address

- on this scale and within its time constraints? Can transdisciplinary collaboration be realized, and how?
- Collaborative learning: how long and how intense will this collaboration project be? How diverse are the participants? What kinds of knowledge do students need in order to collaborate successfully in that particular context?
- Professional learning: which virtual and local work environments need to and can be set up or engaged (outside the university) and used for learning?
- Personal learning: at what points during the course, or the modules of a minor or a full program, do normative, cultural, and value-related reflection spaces make the best use of the learning settings? What kind of learning portfolio is appropriate to the scale of the glocal program?

“Why”

- How are the educational goals of the glocal curriculum that guide the course, minor or program also aligned with the larger context in which it takes place?
- For example: if it is one course, how is it aligned with the educational goals of the students’ disciplinary programs; if it is a minor or full program, how is it aligned with the departments and universities? If there are conflicting educational goals, how can this be resolved? Can conflicts be addressed as a learning opportunity?

“What”

- How are intended learning outcomes for each learning area anchored in the course or the modules of a minor or program? How are they made transparent to students? How are they integrated in assignments and assessments?
- In a one-course glocal curriculum, weeks or clusters of several weeks can be thought of as modules as units of meaning.
- The worksheet for structuring the curriculum along *continuity* (building skills and competencies over time in each learning area) and *integration* (combining the learning areas in meaningful ways to provide all elements needed for each module) can be applied on all three scales.

“How”

- How are the five key components of teaching a glocal curriculum present in the course, minor, or program? What are scale appropriate settings for:
 - Problem-based and interdisciplinary approaches to the main topic of your curriculum?

- Research based and experiential learning in and for a real-world issue?
- Collaborative learning?
- Self-directed learning?
- Critical emancipatory learning in regards to sustainability and your main topic, but also in regards to all other learning areas?

Closing gaps

- How are the three curriculum dimensions anchored in each learning area? Do students get the relevant kinds of knowledge (ways of knowing), as well as experience (ways of acting) and critical reflections and affective engagement (ways of being) in each?
- For a one-course glocal curriculum, time constraints are most challenging: the glocal curriculum requires engaging more subjects, even in a one-semester time frame. Reduce the scope of the course rather than dropping learning areas entirely. What intended learning outcomes are truly essential in each area for the scale and scope of your glocal curriculum?
- Are there actual learning opportunities for all intended learning outcomes?

“When”

- What are you planning for the stages of experience-based learning, research, and communication of results in your curriculum? What are realistic activities and scope for each phase in relation to the scale of your glocal program?
- Which modules (as units of meaning) does your curriculum have? How are they distributed over the duration of your glocal program?
- How are the intended learning outcomes of each module integrated across the learning areas? What is the right timing of inputs and learning activities?
- Particularly in a minor or major program, check for possible conflicts by asking: When do the students need what in order to fulfill the module's learning outcome and successfully produce its deliverable?

“Where”

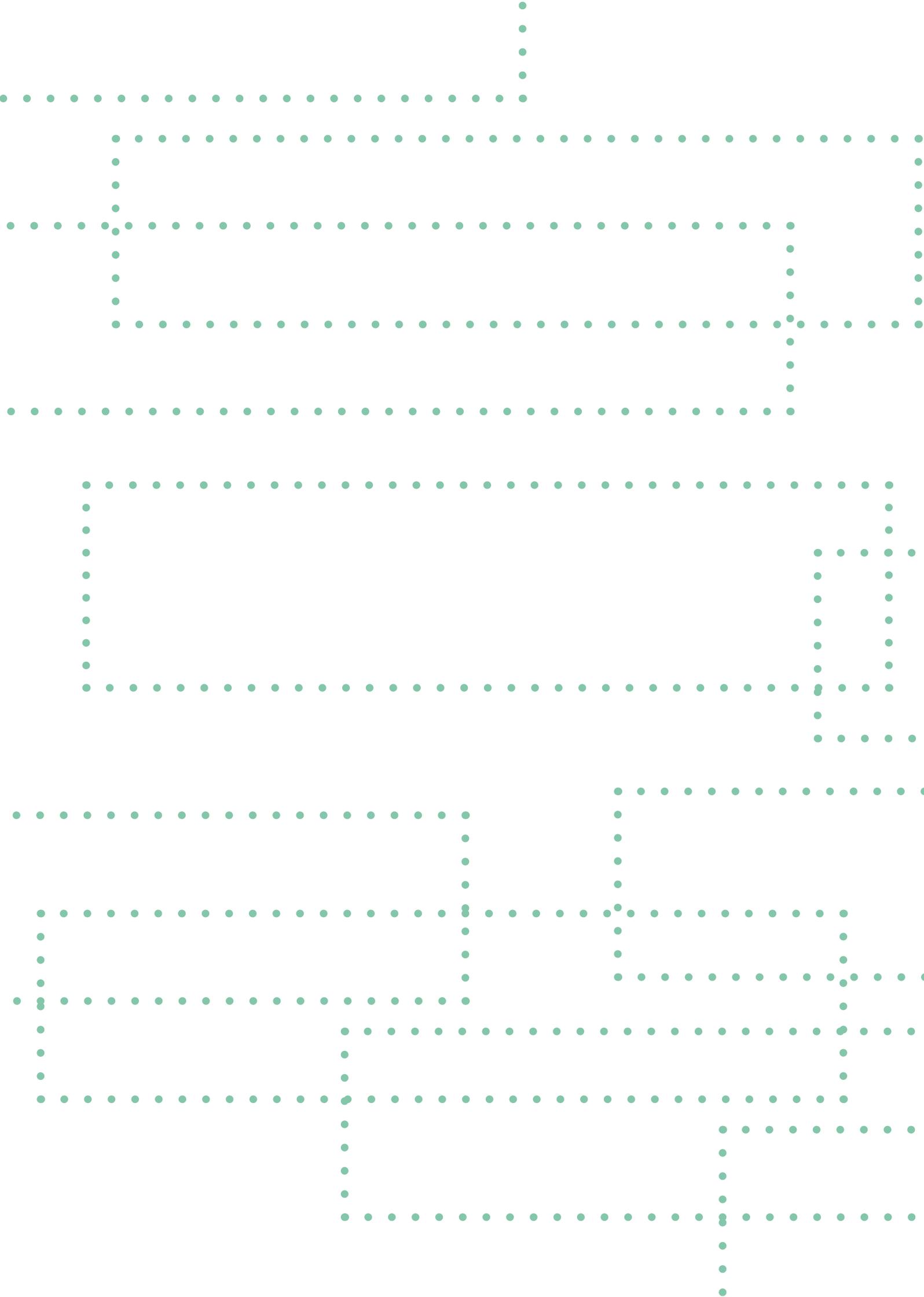
- For a single course: in which of the weekly sessions and/or other settings will those learning opportunities take place?
- For a minor and major program: in which of the modules, and which of its classes and/or other settings, will those learning opportunities take place? What are spaces that provide cross-course integration? These should extend throughout the entire program, not only happen at the end (e.g. capstone seminars).

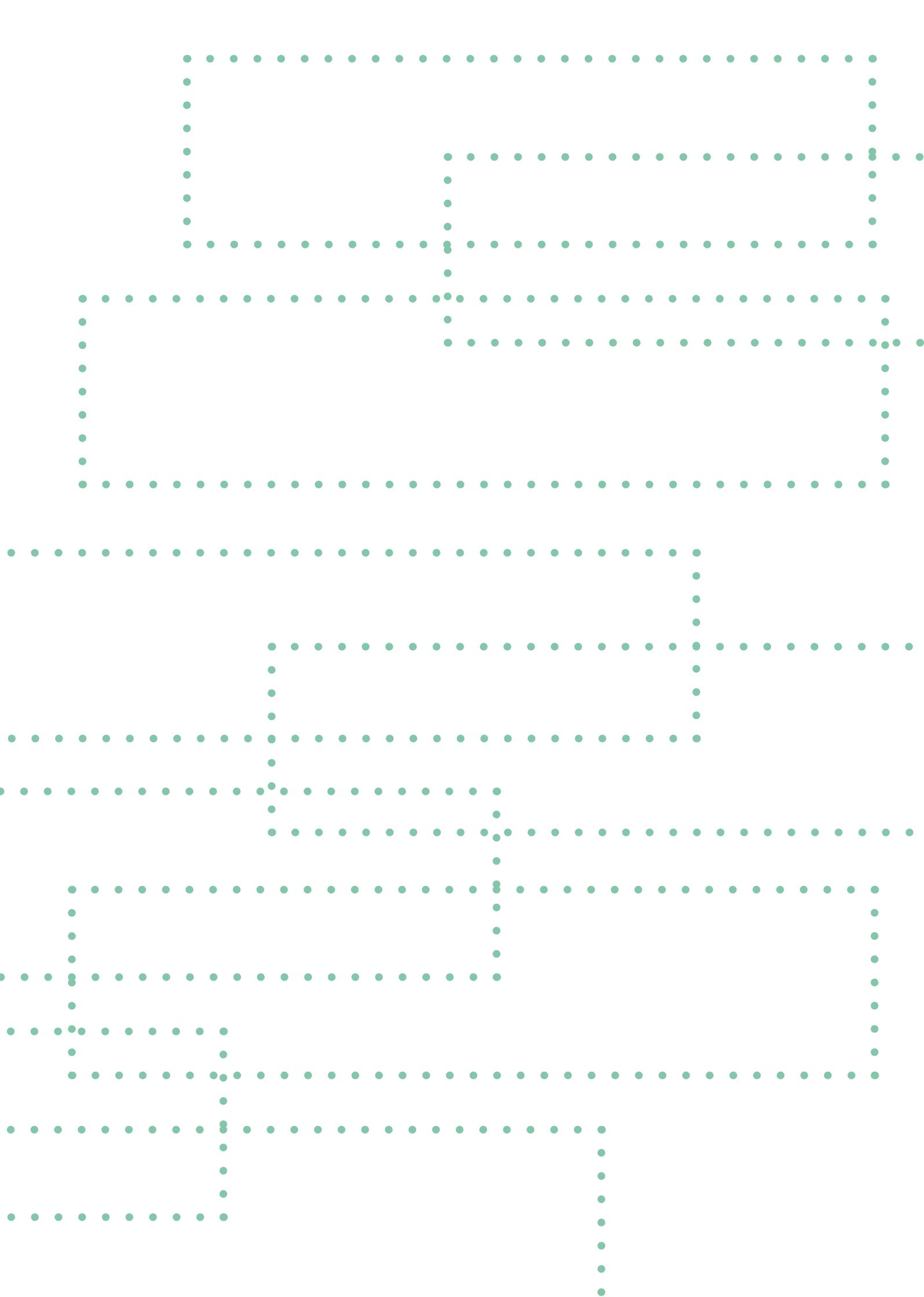
“Who”

- Based on the “what” and the “how” of your intended learning outcomes across all learning areas as well as your teaching concept, what expertise and competencies do instructors teaching in your glocal curriculum need to have?
- What are specific expertise and competencies that need to be conveyed or taught in your glocal curriculum? Who can bring these to the team?
- Here, a minor or major program provides more opportunities because it includes more people. For a single course: if you think you may not have all the competencies or teaching expertise you need (which would be completely normal for a glocal curriculum!), can you outsource it and ask colleagues to step in for one class?
- Are there external resources—trainers, professors of practice, etc.—you need?
- Can you and you students do a training workshop together (such as diversity training)?

Particular challenges

- How are the modules aligned with the different academic calendars?
- For a one-course glocal curriculum, this may be a difficult task. How long is the period when the two universities’ semesters overlap? Can you schedule learning activities to the non-shared times without losing cohesion in the program?
- For a minor, pay particular attention to the majors’ demands on the time and workload of participating students. And can you use non-shared time productively, for example for a student exchange?
- It is important when choosing session times for your glocal curriculum to know if there are required courses in the students’ majors that have a fixed time slot. Avoid scheduling conflicts!
- For a full program, are there program or graduation requirements at the participating universities you need to integrate into your modules (such as a required course in methods)?
- When are grades due at the participating universities? Can you design module times and deliverables so as to meet all requirements and due dates?





PART3 - DESIGNING GLOCAL TEACHING LEARNING ENVIRONMENTS

Components generally	Major shifts in educational theory and practice such as competence-based education and learner-centered education, as we have already seen, are contributing to curriculum reform. These approaches also shape the design of teaching-learning environments. A teaching-learning environment encompasses all components and activities that facilitate learning. These include the physical surroundings, as well as all psychological, emotional, social, and cultural aspects that affect a learner and her development (Abualrub, Karseth, & Stensaker, 2013; Hiemstra, 1991).
Components in science	Learning environments are designed to enable the development of sense-making of different kinds of knowledge, while, at the same time, supporting and accommodating different learning styles. In such environments, learners are exposed to, make use of, and find a balance among a variety of resources, communication channels, and processing tools, while also engaging in different types of collaboration. The role of these different components of learning has been the subject of research that includes interdisciplinary learning science, neuroscience, cognitive psychology, clinical psychology, and anthropology (Bransford, Brown, & Cocking, 2000).
See Background Box 18	Insights from these areas of research challenge traditional, teacher-centered, formal learning settings and help to develop innovative designs. They contribute to creating effective teaching-learning environments that allow for competence development. Pedagogical innovation of this kind has been especially called for in sustainability education literature (Barth, 2015; Brundiers et al., 2010).

SCIENCE AND RESEARCH FOR TEACHING-LEARNING ENVIRONMENTS

Results from cognitive and educational neuroscience inform good teaching practice by stressing the importance of individual and collective learning capacities while taking into account learning styles, processes, emotions, informal and formal settings etc. (Goswami, 2006; Zull, 2004). Findings from experiential learning show that initial experiences and encounters determine student approaches to connecting, abstracting, and testing information downstream (OECD & CERI, 2008). Studies of technology-enhanced learning focus on models that include technology as a medium for social interaction “with, within, and through”. These studies also look at the developmental processes of creativity and innovation, collaborative learning, and

trust-building (Howard-Jones, Ott, van Leeuwen, & de Smedt, 2015).

Constructivist learning theories are based on the idea of learning as building relationships between old and new knowledge. This way of constructing knowledge determines what is learned and how it is understood. This perspective affects how learning outcomes are communicated, the kind of motivational context that is created, and what meaningful learning activities are selected (Biggs, 1993; Biggs & Tang, 2007). In experience-based and experiential learning, such as transdisciplinary research-based learning or cognitive apprenticeship, knowledge is connected to develop in-depth understanding, abstraction, and transfer (Fishman & Davis, 2006; Scholz & Tietje, 2002; Stauffacher, Walter, Lang, Wiek, & Scholz, 2006).

Background Box 18 Science and research for teaching-learning environments

A TEACHING-LEARNING ENVIRONMENT FOR A GLOCAL CURRICULUM

We know that students understand big phenomena best when they are illustrated with vivid examples. So why shouldn't we take examples for biodiversity loss, extreme climate events, or ecosystem services from our local surroundings? This lets students explore global changes on a local level and understand how they look from different perspectives. But we are also searching for the best solutions for global problems and want to help students to learn and innovate early in their academic career. Part of our job is to make solutions from all over the world available to them, without oversimplifying their contexts and complexity. In order to find innovative and pragmatic solutions, students should have the opportunity to immerse themselves in these solutions, connect with the people implementing them, while learning about their societal and cultural dimensions. In today's technology-enhanced work environments, it isn't a problem anymore to gain access to other people's lives. But learning and critical enquiry requires more than online voyeurism; it needs a meaningful and self-reflective application of digital tools in an e-learning environment. This is about the global and local, virtual and real dimensions of the teaching-learning environment, as well as how motivation and collaboration can result in a new learning experience.

Access to sustainability solutions

See Figure 4 in Part 1

We describe a teaching-learning environment based on this theoretical orientation as:

variable spaces and settings in which students and instructors get together and interact, as well as spaces and settings in which instructors meet each other, and students meet each other.

Definition teaching-learning environment

This is our understanding of a teaching-learning environment. Background Box 19 shows the dimensions that make up such effective and innovative teaching-learning environments and also make planning simpler (Barth, 2015; Biggs & Tang, 2007).

In the following sections, we introduce these specific dimensions and provide practical guidance and illustrative examples. In each section, you will find some theoretical background, a brief checklist and "how to" for transfer, real examples from the Global Classroom project, as well as recommendations for further reading. In Section 3.1, we give a broad overview of what a teaching-learning environment is and how to best design one. In Section 3.2 we look more closely at collaboration, roles, and relationships between students and instructors and how they can redefine the classic student-instructor relationship; and in Section 3.3 we introduce the dimensions of the virtual and the real, discussing which virtual teaching and e-learning options are available, as well as what technology can contribute.

3.1 DIMENSIONS AND DESIGN OF A TEACHING-LEARNING ENVIRONMENT

Rethink via content and learning outcomes

Obviously, there are some settings, such the lab or in the field, that can determine how a class is structured. Yet, rethinking the dimensions and processes involved in the design of a teaching-learning environment can help you to break fixed patterns. You can rethink environments not solely in terms of content, but also as in terms of learning outcomes. Innovative combinations of settings, roles, and relationships may provide space for new learning experiences and learning outcomes.

This chapter describes the dimensions that come together in a glocal teaching-learning environment to help you see how they can support the development of your own environment. In the next sections we go more deeply into these dimensions and map out how we can operationalize them. Finally, we provide you with a worksheet to help you in the planning process.

3.1.1 Four Dimensions for Effective Design

Appropriate tables and chairs, a projector, and good air quality undoubtedly have a decisive influence on the environment, but they are not the only components that need to be taken into consideration. Approaches to curriculum design typically only take a cursory look at the environment. They jump directly from talking about learning outcomes to the setting and activities. A closer look at the environment, however, shows that there are some dimensions that can help form effective teaching and learning experiences.

See Section 1.3

DIMENSIONS OF AN EFFECTIVE TEACHING-LEARNING ENVIRONMENT

	Dimension	Description
Learning direction	<i>Self-directed</i>	Refers to the entire learning endeavor; basic principle for learning environments; encompasses responsibility, self-monitoring, and self-management; active engagement with knowledge by connecting to existing experiences
Place	<i>Local and global</i>	Refers to the social and cultural diversity of methods, contents, and activities; learning experiences explicitly rooted in both the global as well as the local scale
Space	<i>Virtual and real</i>	Refers to a space that is no longer located only in a physical classroom; tools, equipment, and activities extend real experiencing in the local environment to digitally enhanced virtual spaces
People	<i>Collaboration and relationships</i>	Refers to psychological and emotional aspects of group learning; extends to individual self-understanding; expertise, roles, and responsibilities of students, instructors, practitioners of the outside community as part of the learning experience

Background Box 19 Dimensions of an effective teaching-learning environment

Often a teaching-learning environment is characterized by its social and cultural context (place), its physical surroundings (space), and its psychological and emotional dimensions (people). But in our approach, we add the learning direction as a further dimension that helps create supportive environments for classes with a glocal curriculum. We characterize a glocal teaching-learning environment as: (a) self-directed, (b) local and global, (c) virtual and real, and (d) including collaboration and relationships. Carefully designing an environment around these four dimensions leads to a set of activities that enable competence-based education. Carefully designing an environment around these four dimensions supports the development of activities that enable competence-based education. They matter strongly when implementing a glocal approach.

See Background Box 19

Design guidelines

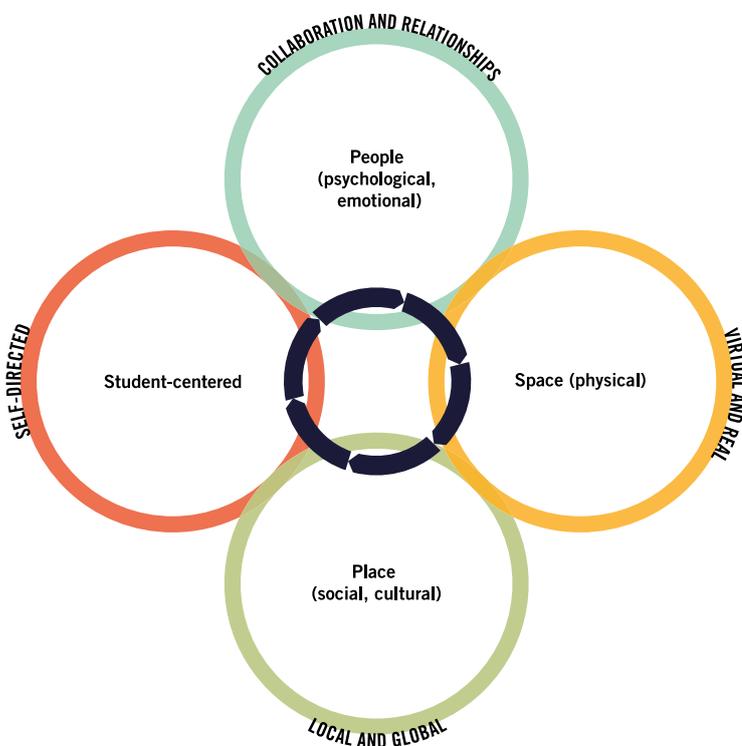


Figure 19 The four dimensions of the teaching-learning environment

It is crucial to carefully align the environment to the entire curriculum design. Only if we start by closely connecting the environment to learning activities and assessments can we ensure a successful teaching and learning experience. Conceptually, the environment is defined by the four dimensions of self-directed, local and global, virtual and real, together with collaboration and relationships. The activities of transformative teaching concepts function as the glue connecting the dimensions of the teaching-learning environment.

Alignment; see Section 1.3.2

See Figure 19

SELF-DIRECTED

Learning direction Self-directedness is a cross-cutting element that is fundamental if the other dimensions are to come into play. It describes the learning direction in the environment as learner-centered, which allows the learner to connect new kinds of knowledge in diverse ways. At the same time, students learn to navigate on their own through a multiplicity of places of learning. Where students are responsible for their own learning process they are emotionally motivated. This stands in contrast with traditional learning environments where the main motivation for students is to find the correct answer in exchange for a good grade.

LOCAL AND GLOBAL

Local and global explained Learning takes place on a local and global scale as it is attached and rooted in the locality of the university, city, and country, but also connected to one or more international partners around the globe. Grounding learning locally is often easy to achieve, regardless of the content and topic.

Local and global operationalized A local to global integration is a great opportunity to cultivate interculturality, experiential learning, and self-reflective learning. Transnational collaboration enriches a class by increasing the diversity of perspectives, kinds of knowledge, and experiences. Guided self-reflection also explicitly includes the local knowledge and the existing kinds of knowledge of the students. Furthermore, local to global integration doesn't only describe learning in the university classroom; it also extends learning into the local community, connecting with people outside the classroom. Students thus engage on an emotional level with their local environment, other kinds of knowledge, and worldviews.

Local and global implemented Student exchanges are probably the most obvious way to realize local and global integration. Project and problem-based learning in transnational teams are, however, settings in which many concepts important to the global curriculum can be integrated. Students work in transnational teams on a shared topic rooted in the local context of the surrounding community, but where research design and project organization is shared globally. Local to global integration is also possible when dealing with methodologies, theories, or phenomena. Literature study is supplemented with small-scale, hands-on explorations, so that students can relate theories and concepts to concrete examples in the real world as well as to their own experiences. Active process management with single-group classes helps students to understand intercultural similarities and differences as well as group dynamics. Finally, realizing these teaching concepts also means a close connection to the dimension of virtual and real.

REAL AND VIRTUAL

Real and virtual explained Learning experiences are located in a real and a virtual space, meaning there is a real, physically tangible setting with face-to-face interaction between people who are actually present. At the same time, this scale is extended through online spaces and digital connectivity, making the global scale as tangible and close to the fingertips as the real setting. You can also see this dimension as an operationalization of the local and global environment.

Real and virtual operationalized Integrating real and virtual spaces actively into the classroom offers new ways to learning. Interdisciplinarity can be taken to another level by introducing global

expertise and perspectives. This applies not only to the students but also to the teaching team. Collaborative environments in a virtual setting differ significantly from working in the same room at the same table. Communication skills, active listening, and sensitivity to subtle cultural differences need to be sharpened because technology functions as a filter medium and tends to display only a fragmented, partial, and distorted segment of the big picture. Using and navigating effectively between these different work environments is an essential requirement in many job settings. A curriculum that integrates this competence helps students to explore their own work styles and develop professional skills needed for the future.

Certainly, there is an endless number of possible virtual settings. However, we should emphasize that a simple webinar or massive open online course is not the type of real-virtual environment we are looking for. Blending both the virtual and the real is what best implements a glocal curriculum. This can happen in multiple ways. Every instructor has her own best practices and favorite learning activities. For example, some prefer role-play and games such as fish bowl, while others use puzzle techniques for literature research. One rule is that we never just assume that a successful activity can be transferred from real to virtual without adaptation. Plenary discussions with large groups connected by videoconferencing can turn out to be very lengthy and unproductive conversations. Virtual spaces can also be created between small transnational teams or pairs of students, and videoconferencing can be enhanced with presentations by a transnational team. E-learning tools today even allow active in-class work on assignments or between individual students in different countries.

Real and virtual implemented

COLLABORATION AND RELATIONSHIPS

This dimension addresses the individual students and instructors (people dimension) in the learning environment, but also their relationships, as well as the networks and collaboration built up and employed in the learning experience. This dimension is not static, but adapts dynamically over time to the different requirements of the modules and teaching contents. It also exists and develops across the transnational collaboration and entails different qualities in real and virtual space.

Collaboration explained

Implementing collaboration within the glocal curriculum is especially important to facilitate discussion across different cultures and to explore interculturality. Similarly, good collaboration in class positively affects the interdisciplinarity of students and instructors. Of course, in transdisciplinary settings working with outside experts and practitioners from the community adds another level to the complexity of collaboration. To work productively on projects also requires training a set of interpersonal and professional skills.

Collaboration operationalized

Diverse settings are possible when one newly discovers the possibilities of collaboration and networking among instructors and students. A setting with a single instructor and a group of students offers fewer opportunities to implementing innovative concepts. Yet, less hierarchical constellations of students and instructors are possible, e.g. in team-teaching settings where multiple instructors with different sets of disciplinary expertise act as coaches across a transnational collaboration. In any case, these new kinds of relationships require structure, whether rules for collaboration, agreements, conduct guidelines, or descriptions of roles and responsibilities.

Collaboration implemented

3.1.2 Scaling Options in the Teaching-Learning Environment

Adaption instead of replication

It is rarely possible to replicate a teaching-learning environment—even when it has been proven effective and innovative. Instead, it is important to begin with the specific locality; modules or programs are not designed on a blank slate without any given or restricting circumstances, beginning with the physical environment (Dede, 2006). So the idea of up- and downscaling the teaching and learning environment addresses the question of how the givens in an environment can be adapted to your purposes and capacities, and what impact this has on people and content.

Conditions vary between academic settings in terms of available personnel, financial and technological support, and class sizes, making the planning of an appropriate teaching-learning environment challenging. For instance, you might have to deal with more (i.e. upscaling) or less students (i.e. downscaling) and have to optimize the glocal learning process accordingly. Choosing to upscale or downscale may be a compromise on the organizational level, yet it should not result in a loss of learning quality. Teaching objectives and the learning environment should always be aligned into the curriculum planning.

Scaling of dimensions

There are several scaling options available for each of the environment's dimensions: local-global, virtual and real, as well as collaboration and relationships. Using dimensions as entry points affects the amount of resources, staff, preparation time, and activities. But even when the goal is to downscale, it may not be an easy process. Often in our classes, we try to accomplish too many things at the same time. Too many learning targets and environments can be overwhelming, leaving us without a chance to achieve our goals. In general, the scaling options show that the dimensions are tightly interrelated, and scaling affects them simultaneously. Yet, by combining and allocating activities and personnel efficiently, you can save resources or create a bigger setting. Therefore, it is important to take an integrated perspective on the entire planning process of a teaching-learning environment.

*See Section 3.1.4
3.2.4 and 3.3.4*

In our checklist, we offer some access points for scaling, and in later sections we deepen these ideas with a focus on collaboration and virtual dimensions.

3.1.3 Assessment and Evaluation

Evaluation of educational process

Assessment of student work

There are two main approaches to determining the quality of the curriculum: First, there is the evaluation of the educational process, including the quality of the curriculum. And, second, there is the assessment of student work. Both approaches have been well researched and methods are available that help instructors to create good evaluations fitting the overall educational process and assessments aligned with intended learning outcomes (Biggs, 1996). We want to give you an overview of the elements necessary to conduct evaluations and assessments tailored to the glocal curriculum and environment.

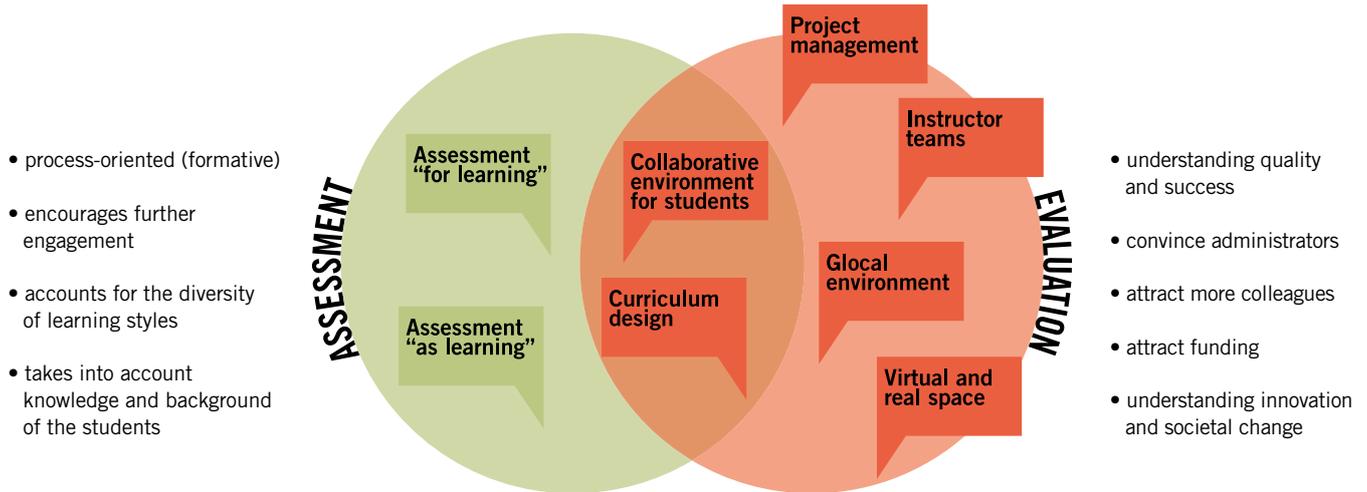


Figure 20 Assessment and evaluation areas

ASSESSMENT OF STUDENT WORK AND LEARNING

Simple tests do not create a self-directed learning environment. In order to avoid fostering the type of student who only tries to supply the correct answer, we need to rethink how we do student assessment. It is important that we get away from the idea that a grade can symbolize the success of a student performance relative to his peers. Moreover, groups of students closely collaborating in a glocal environment yet subject to transnational institution-specific assessment criteria is potentially an explosive issue. Therefore, you would be well-advised to handle this issue cautiously. In general, self-directedness requires us to think about an assessment strategy that

- is process-oriented and formative
- encourages further engagement
- accounts for a diversity of learning styles
- takes into account the kinds of knowledge and background of the students

Assessment in the glocal curriculum should facilitate individual learning, be relative to the learning outcomes, and closely related to the content. In a more comprehensive program evaluation, you should also consider unintended learning outcomes. Dimensions of the glocal environment need to be factored into the assessment type as well. A transnational collaboration involving collaborative work as well as global diversity should also influence how you combine individual and collective activities for assessment. Assessment can also take place in virtual space. E-learning settings and virtual tools can either frame the space where assessment takes place or be a part of what is being assessed.

In a learner-centered, self-directed glocal environment, we consider assessment for learning and assessment as learning to be the most suitable formative assessment methods available (Earl, 2003). Assessment for learning is process-oriented and delivers information about how learning is proceeding for the students during the session or module. This kind of assessment allows you to track how students use the self-directed environment and what obstacles arise, especially in virtual space. A process-oriented and active feedback culture allows you to quickly adapt sessions and modules to enhance student learning. It will also

Assessment and self-directedness

Intended and unintended

Individual and collective combined

Assessment for learning

Assessment as learning

help uncover student interests and might also guide class content to a certain extent. Furthermore, it also detects new learning opportunities while the class is ongoing. By also having the students themselves conduct their own assessment, assessment as learning goes more deeply into the idea of the self-directed environment. Especially in project-based and coached learning, this type of formative assessment helps you to guide learning by empowering students to set personal goals. Collaborative work in a glocal environment also benefits greatly from peer-to-peer feedback during the process. This type of assessment also captures individual learning outcomes. Student-generated results in both types of assessments may also be used in a summative assessment.

Institution's regulations

A serious detriment here is that institutional regulations often require a classic summative end-of-the-semester assessment and so undermine innovative approaches. These requirements are specific to national academic systems or university structures, or they may be guided by transnational agreements such as the Bologna Process of the European Union. Yet it is worthwhile to see whether some forms of examination allow for formative assessments. For example, after an iterative process of student work and constructive feedback during the semester the last piece of student work, which is the only piece graded, reflects several pieces of work undertaken during the learning process.

Assessment for learning and as learning allows you to design a comprehensive set of assessment activities that can change student attitudes towards grading in the long run. Practically, you might want to consider the following points:

- Check at the beginning what the requirements are in collaborating universities and then create conversion tables between the different grading systems and evaluation criteria. A shared baseline communicated to students early on gives them a sense of security.
- When grading in two different systems, the most important issue may be managing expectations. This becomes possible once you have operationalized your learning outcomes into assignments and criteria for assessment.
- Remember you always have the option to choose between group and individual assignments.
- The assessment activity should be closely interlinked with student work. Good ideas for these types of assessment can come from reflection activities during collaborative group work.

See Section 3.2.3

EVALUATION OF THE EDUCATIONAL PROCESS

Evaluation and dimensions and curriculum planning

In order to move from a pilot version to an established curriculum, you will need to evaluate your curriculum from several angles, not only to get some evidence on how successful you were in achieving your goals, but also to convince administrators of your success or to attract more colleagues or more funding. Evaluation should be aligned with curriculum planning and the dimensions of the teaching-learning environment. Like student assessment, evaluation can be formative and allow you from the beginning to adapt to challenges as they arise, or it can be summative and give you an idea about whether you have reached your goals concerning module content and design. Curriculum design is a fast growing field, especially in sustainability science, and it addresses the expectations society places on the university and its graduates. So you should also con-

Inclusion of advances

sider in your evaluation recent advances in learning and educational research, changes in technology and the economy, as well as societal developments and values.

Inclusion of advances

The main points of evaluation that you should consider are:

- a. curriculum design
- b. project management and instructor teams
- c. the glocal environment
- d. virtual and real space
- e. the collaborative learning environment

The evaluation aspects (a) and (e) are closely related to formative assessments of student performance, which will give you a good idea about the success and coherency of the curriculum. Assessing student competence development is not as easy as it sounds, but we recommend using the student's own reflections and the results of the final feedback session.

A more comprehensive and in-depth approach to evaluation requires some sort of triangulation or mixed method approaches. Use student work as the starting point and then consider final reflection meetings, self-assessment surveys, or group interviews to provide more fine-grained details. Additionally, many universities already have a quality management and teaching evaluation system in place, and it would then make sense to use these systems as one perspective on the process. The remaining aspects such as project management and team-teaching (b) can be covered through regular feedback, also among instructors.

Triangulation of methods

Whether you plan to assess unintended learning outcomes, personal student development, or the curriculum impact on students, you need to be aware of the many independent factors students are exposed to. A real measure of the extent to which students have developed into critical citizens is, however, hard to make part of your evaluation. Stick to indicators that you can operationalize and that will practically help you to improve your teaching.

3.1.4 How to Plan All Components of your Glocal Teaching-Learning Environment

Once the curriculum and teaching contents have been defined, the next step is to design a teaching and learning environment appropriate to your class goals and curriculum requirements. There are four important areas: people, place, space, as well as assessment and evaluation. The self-directed dimension is a cross-cutting element and will appear in all of them. We have compiled a comprehensive checklist to help you choose the dimensions most relevant, and manageable, for designing your glocal environment (see Figure 21).

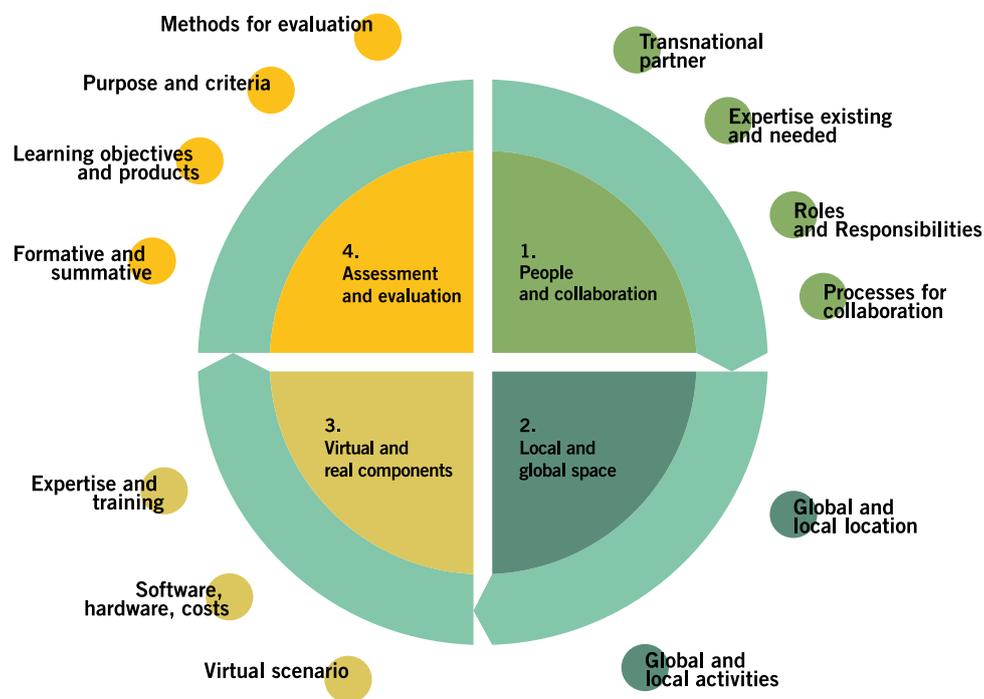


Figure 21 Overview: how to design a glocal teaching-learning environment

1) PEOPLE: WHO ARE THE PEOPLE IN YOUR ENVIRONMENT? HOW DO THEY COLLABORATE AND WHAT ARE THEIR RELATIONSHIPS?

You will need to think carefully about collaboration among students and instructors as it is the most crucial element in this teaching-learning environment. Depending on your design, additional resources may be needed.

- Who is your transnational partner?

Check the intercultural setting, differences in academic systems, and other factors for creating a shared teaching-learning environment. Also check what is needed to realize the type of collaboration you are planning with your partners.

- What expertise do you have, and what do you need?

Get to know the people you would like to bring into your teaching-learning environment. Check their academic backgrounds and what topics they would feel comfortable talking about. Don't limit this to instructors, but also consider the backgrounds of students and outside experts and practitioners.

- What roles and responsibilities are necessary in your team?

This has to do with the roles and responsibilities needed in different types of teams and team-teaching, e.g. coach, lecturer, or integrator.

- What kinds of processes are needed to facilitate student collaboration?

You can foster collaboration and relationships in the environment by implementing appropriate processes in the module and organizational structure, e.g. decision-making structure, communication agreements, and reflection activities.

2) PLACE: WHAT ARE YOUR LOCAL AND GLOBAL COMPONENTS?

- Where is your transnational partner located?

In the beginning it is important to distribute the general space where teaching and learning takes place and adapt the activities to the environments. This area is strongly connected to module content and curriculum design.

- What happens locally? Do you have connections to local experts and practitioners?
- What happens globally with the partner?

3) SPACE: WHAT ARE THE VIRTUAL AND REAL COMPONENTS OF THE ENVIRONMENT?

- How digitally literate is your team?
- What is an appropriate scenario (e.g. blended learning setting) for your virtual-real setting?
- What costs do you expect to spend for setting up this environment (personnel, software, and technical equipment)?

When identifying the actual tools you will need, you are also making decisions about how to use synchronous communication and how to increase student digital literacy on all fronts. Your team may want training to manage the technical set-up, and additional expertise may be needed for troubleshooting during a class.

- What software tools and technical equipment do you need?
- What expertise and training do you require?

4) ASSESSMENT AND EVALUATION

Assessment and evaluation deal with the processes and performance of both the students and the curriculum. You should aim here to integrate curriculum design and student work as much as possible. Use the worksheet below for planning purposes.

For student assessment, you might want to check:

- What are the requirements concerning grading in the transnational collaboration? How should they be handled?
- Are your learning outcomes all covered in the assessment?
- Are the dimensions of the teaching-learning environment covered in the assessment?
- What work are your students producing? What can be used for assessment purposes?
- What is your formative assessment strategy? Your summative assessment strategy?

For the curriculum evaluation, you may want to check:

- What is the purpose of your evaluation? Is it general performance, attracting new funders and collaborators, or something else?
- What is your formative evaluation strategy? Your summative evaluation strategy?
- Are the dimensions of the teaching-learning environment all covered in the evaluation?
- Are you also evaluating how well advances in educational science, changes in societal expectations or technology are integrated into the curriculum?
- What student assessed work provides you with information about the curriculum?

	Types of assessment	Grading / grade conversion	Deadlines and schedule
Partner A requirements 			
Partner B requirements 			
Student work 	Assessed work 1	Assessed work 2	Assessed work ...
Learning outcomes 			
Due dates 			
Assessment type ✓	<input type="checkbox"/> <i>as learning</i> <input type="checkbox"/> <i>for learning</i> <input type="checkbox"/> <i>summative</i>	<input type="checkbox"/> <i>as learning</i> <input type="checkbox"/> <i>for learning</i> <input type="checkbox"/> <i>summative</i>	<input type="checkbox"/> <i>as learning</i> <input type="checkbox"/> <i>for learning</i> <input type="checkbox"/> <i>summative</i>
Task type ✓	<input type="checkbox"/> <i>group</i> <input type="checkbox"/> <i>individual</i>	<input type="checkbox"/> <i>group</i> <input type="checkbox"/> <i>individual</i>	<input type="checkbox"/> <i>group</i> <input type="checkbox"/> <i>individual</i>
Teaching-learning environment dimensions ✓	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>
Part of curriculum evaluation 			
Feedback 	[Types, Purpose]		[Schedule]
Other checkpoints ✓	<input type="checkbox"/> <i>institutional requirements on assessment</i> <input type="checkbox"/> <i>expectations for instructor performance</i> <input type="checkbox"/> <i>rubrics reflecting quality expectations</i> <input type="checkbox"/> <i>planned feedback process with students</i>		

3.1.5 Conclusions

Rethink and adapt	The glocal teaching-learning environment forces us to reconsider our planning routines and, especially at the beginning, invest more time in rethinking and adapting running systems. You need to carefully and realistically consider the time you will need for preparation and organization in addition to the time spent in class, if you want to avoid frustration with overworked students—and collaborating instructors. Although students are more engaged in an innovative environment, their motivation and concentration can easily decrease if the workload is too high. Formative feedback and evaluations that lead to adapting the learning environment can be very helpful in maintaining their level of engagement. Don't forget that instructors too are challenged by constantly changing settings and tasks as they engage with students through the learning environment. The basic principle remains that developing the competencies for students to become critical citizens can only be accomplished by different combinations of spaces, places and people realizing and fulfilling the intended learning outcomes in a glocal curriculum.
Formative feedback for improvements	
Combinations of dimensions	

3.1.6 Further Reading

ON PRACTICE AND MATERIALS

Biggs, J. & Tang, C. (2007). *Teaching for Quality Learning at University*. Berkshire: Open University Press.

Eberly Center & Carnegie Mellon University (2015). Design & Teach: Teaching Excellence & Educational Innovation. Retrieved July 15, 2016, from <http://www.cmu.edu/teaching/designteach/>

ON BACKGROUND AND THEORY

Barth, M. (2015). *Implementing sustainability in higher education : learning in an age of transformation*. London: Routledge.

Barth, M., Michelsen, G., Rieckmann, M., & Thomas, I. (2016). *Routledge Handbook of Higher Education for Sustainable Development*. (M. Barth, G. Michelsen, M. Rieckmann, & I. Thomas, Eds.). London: Routledge.

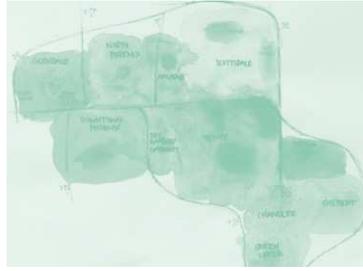
ON CURRICULUM EVALUATION AND STUDENT ASSESSMENT

UNESCO International Bureau of Education. (2013). *Training tools for curriculum development: A resource pack*. Geneva. Retrieved from http://www.ibe.unesco.org/fileadmin/user_upload/Publications/Training_tools/IBE-CRP-2014_eng.pdf

University Office of Academic Planning and Assessment (2001). *Program Based Review and Assessment: Tools and Techniques for Program Improvement*. Retrieved from http://www.umass.edu/oapa/oapa/publications/online_handbooks/program_based.pdf

Pacheco, R. J. (2014). *Internet Resources for Higher Education Outcomes Assessment*. Retrieved July 15, 2016, from <http://www.assessmentcommons.org>

UNESCO International Bureau of Education. (2016). *A Conceptual Framework for Competencies Assessment*. Retrieved from <http://www.ibe.unesco.org/en/document/conceptual-framework-competencies-assessment>



Results of local urban experiences and global sharing between transatlantic partners via Adobe Connect

GLOCAL EXPERIENCE-BASED LEARNING AND ITS TEACHING-LEARNING ENVIRONMENT

Our Global Classroom hosted a set of activities we named “Experience-based Learning Framework”. The students engaged in a series of mental mapping and transect walking activities in Lüneburg and Hamburg (Germany) and Phoenix and Tempe (Arizona, USA). Mental mapping and transect walking activities are experience-based learning tools used in ecology, geography, and anthropology research. Students, without necessarily having prior knowledge about the topic or commitment, leave the classroom and engage with their local environment by exploring and experiencing sustainability issues in the real world. They learn systemic thinking, normative thinking, and develop collaborative competencies, such as critically analyzing problems and developing workable solutions.

What were the local and the global places?

Locally the students explored their surrounding urban areas of Lüneburg and Phoenix. Many of them emotionally engaged with their cities for the first time. They interviewed people on the streets, recorded problems and solutions, and later analyzed them from a sustainability perspective, getting a first impression of the global aspects of these problems. They also compared their findings with their partners across the Atlantic, and immersed themselves in each other's very different climates, landscapes, and lives: the heathland and the desert. Students prepared their findings, demonstrating intercultural awareness, and they reflected on their own view of these problems and how their perceptions had changed. This process of situating new experiences is closely connected to the next point of expertise and processes.

Who were the people involved, and what was their expertise?

Instructors had some basic expertise in qualitative methods, such as mapping and walking techniques,

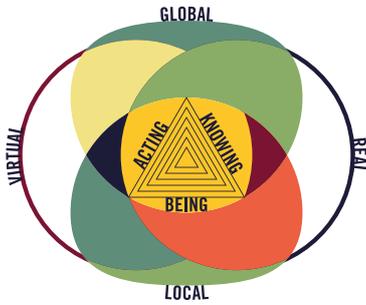
and were able to synthesize individual and collective results. They were able to critically and sensitively reflect on the cultural differences and similarities between Germany and the USA. Their moderation of the synthesis and discussion phases was also important, as were being able to use tools for work collaboration, group dynamics, and planning so they could guide students through the learning process. The students who started this activity were freshmen and so had not done any previous coursework in sustainability. They did not have any special knowledge about their local area, but discovered hidden kinds of knowledge through the activities themselves.

What were the virtual and real components?

We used a broad range of tools for recording and visualization, including GPS tracking via smartphones; video and photo recording for the collection of data during the transect walks; video conferencing via Adobe Connect to support the transatlantic exchange of insights in small groups; and video conferencing of the entire plenary sessions for final summaries. Real components took mostly the form of local activities in urban areas, but also involved training in the technical equipment.

What was the student assessment strategy?

Some of the experience-based activities in our Global Classroom were taught separately at each partner university, who also took responsibility for assessing their own students' work according to their respective grading systems. The major summative assessment happened at the end of the module. At the Leuphana it included a second piece of work; at the University of Arizona the experience-based activities counted for 15% of their students' final grade. (Caniglia et al., 2016).



3.2 COLLABORATING IN THE GLOCAL TEACHING-LEARNING ENVIRONMENT

It's the first class of the semester, and the professor introduces the syllabus to the students, and her idea about how innovative teamwork will facilitate learning and make the class more fun. But her students moan in one voice: "Again? We're always doing this!" But soon the students are taking part, forming groups, and beginning to work on their topics. Everything seems to be going smoothly when, surprisingly, things get out of control. One student keeps switching between groups and isn't sure about her topic anymore; she doesn't work well with the others and eventually loses interest. Another student is highly motivated, but her team members take advantage of her engagement and let her do most of the work. The final groupwork presentations turn into a confrontation with students taking sides. Some of the students are very frustrated; they feel overworked and are dissatisfied with their work. Grading suddenly becomes an issue because some of the work by individual students is questionable. After the last class, the professor thinks it wasn't a good idea after all; she is not sure what the students actually learned, and so she decides to go back to giving lectures next semester.

This might sound familiar to you. In this chapter we want to give you some ideas on how to avoid such a situation, or, if necessary, how to successfully cope with it.

Three sets of partners	Planning new forms of collaboration in diverse classroom settings involves a new understanding of relations in three sets of partners: (a) student-student, (b) student-instructor, and (c) instructor-instructor. The self-directed principle puts learning at the heart of this teaching-learning environment, as we already highlighted in Part 1. Interactions in the three sets are characterized by collaboration and not by a giver-receiver relationship, where students search for the correct answer—and a good grade. To emphasize this flatter hierarchy, we use the term instructor instead of professor, lecturer, or teacher. Instructing refers more clearly to the action-oriented and practical knowledge that is included in the teaching aspect of the environment. This is also more appropriate when learning takes place in the community and so the role of teaching is no longer bound to an academic position.
Instructor vs teacher	
Active management for navigation	Collaboration is also a topic that is closely connected to our local and global settings of learning, as different types and levels of communication and collaborative competencies are needed in order to navigate in virtual teams and to work productively. Problems arise due to different transnational academic cultures, but also when students are simply confronted with community experts and practitioners from other parts of the world. It is important to actively manage these settings in a glocal teaching-learning environment if students are to profit from these learning experiences. This opportunity can help students prepare for their future professional or research career.
Three topics	Basically, there are three topics you want to consider when you plan your own collaboration in a glocal environment: (a) the expertise needed (b) the roles of students and instructors, and (c) useful settings. The last section is a checklist that can serve as a planning tool. The following sections explain more about the background and methods.

3.2.1 Expertise for the Glocal Teaching-Learning Environment

Expertise is needed to move comfortably within the glocal teaching-learning environment. First, the five areas of expertise needed for teaching—disciplinary, methodological, collaborative, intercultural, and technical—might make it necessary to have a teaching team. Second, as students are an essential part of the collaboration, their level of expertise needs to be considered, too. And third, we must also consider collaborating experts and practitioners from local communities, whether they are engaged on an one-off basis or for the entire process. So, let's take a closer look at the expertise of these three groups.

Five areas of expertise

INSTRUCTORS

- Disciplinary and interdisciplinary expertise is needed to draw up a curriculum and then guide students through its contents and processes.
- Methodological expertise is needed to enable students to deal with research processes, which may involve transdisciplinarity.
- Collaborative expertise is needed to manage work processes among instructors and with students.
- Intercultural expertise is needed in a global or transnational collaboration, not only to organize an effective work environment, but also to make interculturality a part of the learning experience.
- Technical expertise in software and computer technology is needed to facilitate global communication and work.

At first sight, attending to all five areas of expertise might appear complicated or challenging and could easily result in an oversized or underequipped team. Therefore, it is important to be aware of which areas your team can easily cover, and know when you need to find other people. How many people are needed to build a complete team, and what expertise is only needed at times? Can training add further expertise to an existing team?

STUDENTS

Students' learning experiences, and how they use the environments, are strongly connected to their prior knowledge and experiences. In order to put the student at the center of the glocal teaching-learning environment, it is vital to know what kinds of students are participating and how much expertise they have.

Students' backgrounds and expertise

A starting point is learning about the academic program they are in and whether it is at the undergraduate or graduate level. Are there prerequisite modules they have already taken? Is this module part of a larger program of study? What disciplinary backgrounds do the students have, and can they be combined to make the class interdisciplinary? This would mean integrating different subject and methodical expertise. Do some students also bring a professional portfolio to the university, with different kinds of expertise and skills from work environments? Finally, what are students' individual backgrounds—whether gender, ethnicity, socioeconomic status, language, or religion—which form part of their expertise?

OUTSIDE EXPERTS, PRACTITIONERS, AND STAKEHOLDERS

It is a little more difficult to learn about the expertise of experts and practitioners from the outside community who are partners in teaching-learning processes. It is important, however, if all parties are to be involved in a satisfying way. A starting point is to know why they have been invited to take part in the class or module. Outside experts and practitioners can provide missing expertise; sometimes that expertise can be developed and trained in the existing team:

Students' backgrounds and expertise

- Disciplinary expertise is needed for students to gain a full and realistic perspective on the problem or solution that the class is studying.
- Pedagogical expertise and involvement is needed to accompany the students on a regular basis. For experts and practitioners from the community the academic setting may be foreign and uncomfortable terrain. It may be necessary to reach some kind of compromise concerning meeting places or use of academic jargon.
- Intercultural expertise in dealing with cultural and practical differences is required for a transnational collaboration. Language competence, in this regard, is an expertise that may also be needed.
- Technical expertise is required to deal with the virtual component of the transnational collaboration.

3.2.2 Roles and Responsibilities for Instructors and Students

Shared process with different roles

A collaborative and flexible environment necessitates different roles than usual in an instructor-student setting with its givers and receivers of knowledge. The glocal teaching-learning environment turns this one-way relationship into a students production and an active learning experience.

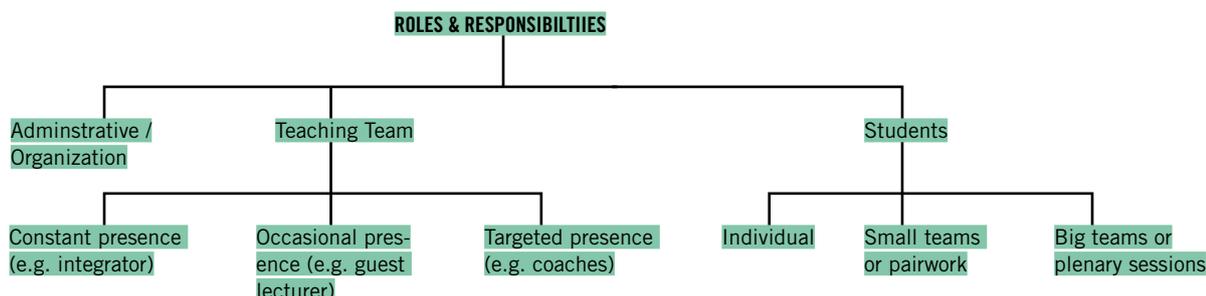


Figure 22 Possible roles of instructors and students in the glocal teaching-learning environment

The roles and responsibilities of instructors and students are not fixed and may change over time. Usually, several different class settings are taking place at the same time. For example, some activities require a constant presence of the instructor in class while for others small teams are targeted with coaching support. One person, usually an instructor, can hold several roles that often overlap. They might be guest lecturers in one class and participate in the role of a coach in another. So, although the specific characteristics of each role are important, it is important to remember that this teaching-learning environment rarely has a class of students with a single professor, but rather different team constellations of students and instructors.

Flexible over time

Several roles in one person

Team constellations

What roles are needed for a glocal teaching-learning environment?

- *Coordinator and leaders:* An environment based on a transnational collaboration requires more coordination than a typical one-dimensional classroom setting. Responsibilities in this area are to ensure accountability and smooth implementation, including coordinated scheduling and the use of materials and technology.
- *Guest lecturer:* In this role the instructor is integrated on an irregular short-term basis as a guest lecturer adding specific expertise, often to increase the set of interdisciplinary perspectives. They typically do not need to know about the entire learning experience processes.
- *Coaches:* In this role the instructor accompanies the students' learning experience as a coach, often for a longer period of time but still on an irregular basis. A coach advises, mentors, and shapes the learning process of a group or individual students. This role can evolve in very different directions, depending on the needs of the coached team, but also based on the skill set of the instructor. A coach can support the integrator by monitoring and evaluating students, working as a coordinator, and helping to ensure a good atmosphere.
- *Integrator:* This role serves as an anchor for both instructors and students. The integrator facilitates short and medium-term changes in settings by keeping an overview of individual group processes. She ensures shared milestones towards the learning outcomes and integrates small group work into the module. When the settings include experts and practitioners from outside the university, this position has additional responsibilities in facilitating the participatory processes (Brundiers, Wiek, & Kay, 2013).
- *Student partnerships and teams:* Student roles in both small and big teams in transnational collaboration are as diverse as the students themselves. Students discover what kinds of roles there are in a team, what skills and knowledge they bring to the class, and how they want to develop. Especially for bigger teams, formal organization is needed, and the student roles should be distributed among the team members.

See Section 1.3.3

The organization of teams made up of students and multiple instructors is similar to creating a project team in the business sector. You can borrow and adapt some of these methods to create a team that caters to the needs of a glocal teaching-learning environment (see Further Reading below).

3.2.3 Tools and Processes for Collaboration

Four settings of interaction

At this point, we know what kinds of expertise are necessary and what roles need to be filled. The next step is to translate these components into a variety of settings and understand how they can be best combined with each other.

We structure the spaces and interactions in the glocal environment into settings where students meet students, students meet instructors, and instructors meet instructors. These interactions are most often found in four different settings: (a) team-based learning in small teams or big teams and groups with generic frontal teaching, (b) team-based learning in medium-sized teams with process coaching by instructors, (c) instructors in team-teaching settings, and (d) active evaluation of students' experiences.

1 Team-teaching and administration (instructors)	2 Organization of processes in virtual teams and plenaries (students)	3 Organization of work processes (students and teachers)	4 Active evaluation of experiences (students)
Meeting culture	Personal/professional profiles	Code of conduct	Structured reflection
Decision-making	Project roles	Communication agreement	Critical incidents
Organigram	Rules for good discussion	Project management	Peer review and feedback
Team-teaching prep	Intercultural training	Housekeeping	Portfolio
Moderation	Team processes		
	Communication training		

Figure 23 Overview of processes supporting collaboration

1) DECISION-MAKING, CONSENSUS-BUILDING IN TEAM-TEACHING AND ADMINISTRATION (INSTRUCTORS)

A functioning collaboration among instructors is a requirement for smooth teaching and administrative processes in multiple settings across the collaboration. At the same time, these structures should be simple, clear, and pragmatic, as the teaching workload is already time intensive, and additional work may overburden the teaching team.

Made simple and pragmatic

- *Meeting culture:* In a diverse team with different areas of expertise and roles, it is important to have regular team meetings, also across the transnational collaboration. It is more efficient if different team constellations attend different meetings: (a) a kick-off meeting for all instructors; (b) an “end-of-semester” meeting for all instructors; as well as (c) regular administration and integration meetings for the lead team.
- *Decision-making:* A clear and participative decision structure helps to form a unified directive or standard that guides teaching. Misunderstandings, also with students, that usually occur when many different people are involved are kept to a minimum. The bigger the team is, the more important it is to have a good consensus-building and reporting process.
- *Organigram:* This quite simple tool helps illustrate the different roles, decision-making processes, etc. to the teaching team. It should be adapted to reflect changes and improvements over time.
- *Teaching team prep:* Preparation for the teaching team is based on a common understanding of what is being taught. Especially in interdisciplinary teaching, this means collecting disciplinary concepts and methods and mapping their differences and similarities. This facilitates the use of different perspectives in teaching without creating confusion among the students.
- *Moderation:* A solid plan for transnational moderation and discussion management in a global team is helpful for a smooth-running class. The flow of activities leading to a specific learning outcome as well as which instructor is responsible for which part of the process needs to be specified in a time management plan for each class (see Global Classroom Example 19).

2) ORGANIZATION OF PROCESSES IN VIRTUAL TEAMS AND PLENARIES (STUDENTS)

Teamwork and classroom work in a global setting can be strenuous because communication is not always face to face. So virtual teams—whether a discussion in a transnational plenary session or teamwork in a small group—require some training.

Made easy and smooth

- *Personal and professional profiles:* Students enrolled in the same program usually know each other superficially. When a transnational partner joins this group, it significantly enlarges both size and diversity, involving participants with different cultural backgrounds, kinds of knowledge, etc. Creating personal profiles or short biographies helps all group members to learn about each other's: (a) interests and motivation for taking the class, (b) knowledge, experiences and skills, and (c) the skills and experiences they would like to develop in the class. These profiles are shared with the entire group and are then open to questions and comments.

- *Project roles:* A variety of different individuals converges in teams, each with their own personality and preferred ways of engaging with others. In order to learn more about each team member and how they can best contribute to a productive process, these psychological preferences can be determined in a test by, for example, companies such as Meyers-Briggs or Belbin.
- *Rules for good discussion:* These rules complement good moderation, helping promote an environment where it is possible to engage interactively and critically. The rules should encourage active listening, keeping contributions brief and to the point, recording the order of contributors, etc.
- *Intercultural training:* All of the learning settings require knowing about the partner country, its academic system, etc. Intercultural training in advance builds background knowledge of the partner, allowing participants to better contextualize communication. Interculturality sessions can also be used to rehearse culturally appropriate communication and help sort out misunderstandings. Native speakers can create difficulties for non-native users of the language. These problems are often underestimated, and so some language sensitivity training needs to be included.
- *Team processes:* Team processes—including international teams—generally undergo the phases of forming, storming, norming, and performing. Teams need to develop a general understanding of these processes so they can then adapt their management tools accordingly.
- *Communication training:* Virtual settings, where body language and facial expressions are unavailable, call for advanced training in communication skills. This is an ongoing process starting from a beginner level with such skills as active listening, nonviolent communication, the “7 Cs of communication”, the ladder of inference, and conflict avoidance and proceeding up to an advanced level of empathic communication. Special training is also important for settings with outside practitioners.

3) ORGANIZATION OF PROCESSES IN COACHING SETTINGS (STUDENTS AND INSTRUCTORS)

Made transparent and clear

Work processes with many members need rules and tools to guarantee high productivity in the performing phase. Transparent and clear processes lead to smooth routines and allow most of the team energy to go into creativity and innovation.

- *Code of conduct:* All team members negotiate a set of rules governing work processes. The rules must capture and accommodate different working styles so the goal of the team can be reached in a good work environment.
- *Communication agreement:* Part of the code of conduct is the communication agreement. This regulates, among other things, use of media and communication platforms, response times, and meeting organization.
- *Project management:* This includes a very large set of tools that helps to build standards and work routines. Basic tools include a work plan with milestones and work packages, the distribution of task-related roles, such as taking meeting minutes, managing documents, communicating with the instructors, etc. Another tool is document/content management software to structure data and student work.

- *Housekeeping*: Constant monitoring by the coach of student group dynamics allows emerging problems and conflicts to be detected and managed in housekeeping meetings. The code of conduct and other working agreements should be reviewed in housekeeping meetings. The instructor moderates and trains the students in the housekeeping process so that further regular housekeeping sessions can then be conducted by the students alone.

4) ACTIVE EVALUATION OF EXPERIENCES (STUDENTS)

It is important for the motivation of a diverse group of students in self-directed learning processes that they are able to give meaning to their experiences (sense-making) and are able to develop their professional profiles. Several processes, closely connected to assessment, help students to appreciate their learning experiences.

Made productive and supporting

- *Structured reflection*: Activities that include the practice of critical evaluation and situating kinds of knowledge are an important aspect of the reflection process. Instead of the instructor taking the role of an expert, this process builds individual expertise among students through reflective enquiry. Students learn to engage in structured reflection and are given regular spaces to do so. Written reports based on guiding questions are just one way of doing this.
- *Critical incidents*: This method identifies incidents of intercultural misunderstandings, problems, and conflicts and then creates awareness of culturally specific interpretations of attitudes and behaviors. When these incidents are moderated by trained instructors in a participative, solution-oriented process, awareness is created of intercultural differences, and students develop the skills to engage in intercultural communication and work. Instructors need to handle cultural generalizations and stereotypes carefully, also in routine problems arising in teamwork. A trusting and transparent environment is crucial for this activity so that conflicts and problematic emotions can be positively resolved.
- *Peer review and feedback training*: Learning to give each other constructive and valuable feedback and make use of that feedback is an active process. Both sides of the feedback process involve very different types of communication and motivations. Peer review fosters accountability, and helps students to learn from the past and enhance future performances. This feedback is most valuable in the performing phase of a team and can be triangulated by means of self-assessment, peer assessments, and instructor assessment. They can be undertaken as a written evaluation, a group discussion or in individual student-instructor meetings. Coaching and a good knowledge about the personalities of the team make this process productive. Additionally, it is useful to connect this with training on how to formulate feedback and engage in nonviolent communication.
- *Portfolio*: This is a collection of the students' best work, of everything they consider to be an important part of their learning experience. This is the basis on which they extend their professional profiles, but it also summarizes the skills they can transfer to other classes.

3.2.4 How to Establish your Glocal Collaboration Among Students and Instructors

This checklist guides you step-by-step through the most important aspects of collaborating in the teaching-learning environment. The diagram below shows all the steps at a glance.

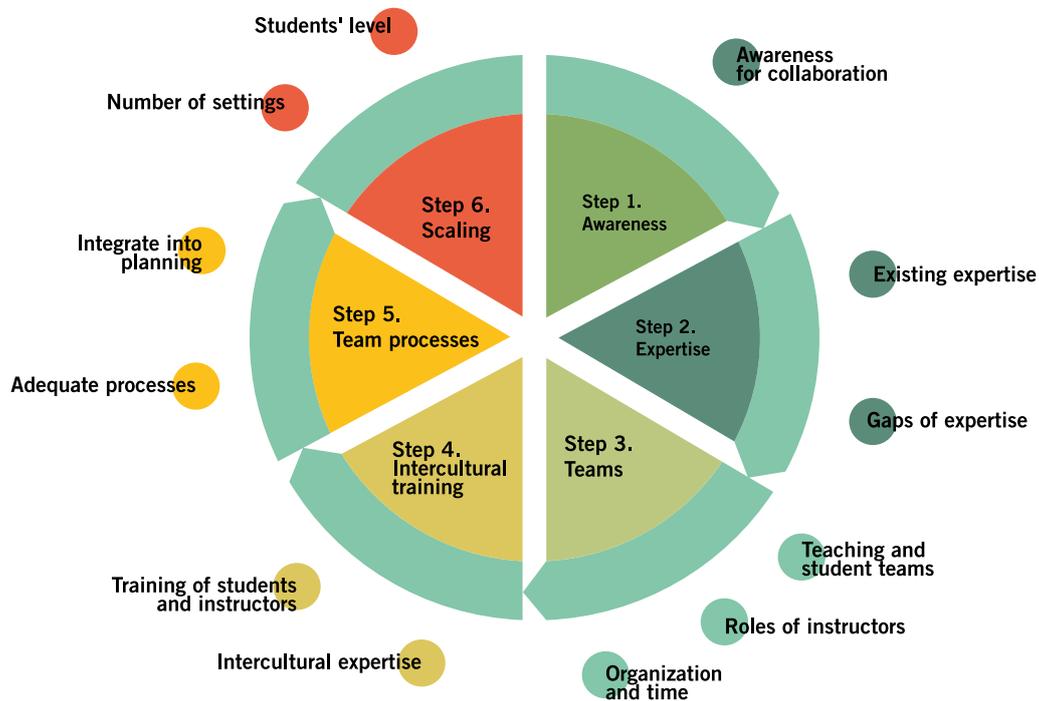


Figure 24 Overview: how to establish collaboration

STEP 1: IS THERE AWARENESS FOR COLLABORATION?

- Create awareness among the planning instructors and with collaborating partners, and acknowledge that this requires materials and training.

STEP 2: WHAT EXPERTISE DO YOU NEED AND WHO IS THERE?

- Is this collaboration transnational?
- What kinds of expertise do the instructors have, and what is needed?

- What kinds of expertise (disciplines, backgrounds) do the students have?
- Are there any existing collaboration with the community or outside experts and practitioners, and what is their expertise?
- Identify the gaps and how they can be bridged (training, additional people, changes in approaches).

STEP 3: WHAT TYPES OF TEAMS DO YOU NEED IN THE ENVIRONMENT, AND WHAT ARE THEIR ROLES?

- Who are the teaching teams?
- What types of student teams are there (small, big, plenary, research)?
- What roles are instructors taking (e.g. integrator, guest lecturer, coach)?
- Build your instructor team and processes using an organigram, work descriptions, decision structure etc.
- Plan how different types of collaborative work alternate.

STEP 4: HOW IS THE TEACHING TEAM TRAINED IN EACH OTHER'S INTERCULTURALITY?

- What is the level of expertise about interculturality?
- If needed, plan training for all parties involved.

STEP 5: WHEN DO YOU NEED WHAT KIND OF PROCESSES TO FACILITATE STUDENT COLLABORATION?

- What kinds of expertise do the students have?
- What kind of collaboration processes do you need?
- How should these collaboration processes be scheduled?
 - Communication and interculturality
 - Teamwork, project management, reflection

STEP 6: HOW TO SCALE AND ADAPT?

- What human and financial resources are available?
- What do students already know? Are they beginners or advanced? Incorporate existing student knowledge about team processes, initiate peer-to-peer learning; at a beginning level, limit to essentials; observe situation and have methods ready to use if needed.
- How many different collaborative settings do you need? Number of students (large classes versus small seminars) or plenary versus small group work, how many groups.

First check ✓	<input type="checkbox"/> awareness among instructors/need for training <input type="checkbox"/> expertise and knowledge level of students <input type="checkbox"/> intercultural training for instructors <input type="checkbox"/> organizational structure for the instructor team <input type="checkbox"/> relationship to curriculum evaluation		
Module Description 	Module 1	Module 2	Module 3 ...
Expertise of instructors 			
Who? 			
Student expertise 			
Gaps 			
Teaching teams 	[names + affiliations]	[names + affiliations]	[names + affiliations]
Roles of instructors ✓	<input type="checkbox"/> coach <input type="checkbox"/> integrator <input type="checkbox"/> guest lecturer	<input type="checkbox"/> coach <input type="checkbox"/> integrator <input type="checkbox"/> guest lecturer	<input type="checkbox"/> coach <input type="checkbox"/> integrator <input type="checkbox"/> guest lecturer
Student teams ✓	<input type="checkbox"/> individuals <input type="checkbox"/> small <input type="checkbox"/> big <input type="checkbox"/> plenary	<input type="checkbox"/> individuals <input type="checkbox"/> small <input type="checkbox"/> big <input type="checkbox"/> plenary	<input type="checkbox"/> individuals <input type="checkbox"/> small <input type="checkbox"/> big <input type="checkbox"/> plenary
Intercultural training for students ✓ 	<input type="checkbox"/> Yes (<i>what</i>):	<input type="checkbox"/> Yes (<i>what</i>):	<input type="checkbox"/> Yes (<i>what</i>):
Teaching-learning environment dimensions ✓	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>	<input type="checkbox"/> <i>global</i> <input type="checkbox"/> <i>local</i> <input type="checkbox"/> <i>virtual/real</i> <input type="checkbox"/> <i>collaboration</i> <input type="checkbox"/> <i>diversity</i>
Collaboration processes: Organization of virtual teams and plenaries 			
Organization of coaching 			
Reflection of students (check with assessment) 			

3.2.5 Further Reading

ON ROLES AND RESPONSIBILITIES

These easy-to-use tools create a better understanding of people's interactional preferences and help build an effective team. Students look into their own profile and then communicate their profile to the group. This is also valuable for instructors who want to organize group processes.

<http://www.belbin.com>
<http://www.myersbriggs.org>

ON INTERCULTURAL PROCESSES

Much of the literature on intercultural training comes from management disciplines and is very practice-oriented. Some intercultural relations have been analyzed in depth already, such as between North America and Germany, or between Southeast Asia and Germany. Where good guides are missing, we recommend sensitivity and diversity training.

Zimmermann, A. *Cross-cultural Team Work*. School of Business and Economics, Loughborough University, Leicestershire, UK.; DiStefano & Maznevski, 2000.

Bertelsmann Stiftung (ed) (2006). *Intercultural competence: The key competence in the 21st century ?* Theses by the Bertelsmann Stiftung based on models of intercultural competence.

Deardorff, D. (2009). *The Sage Handbook of Intercultural Competence*. Sage Publishing, 2009: 561.

Apedaile, S. & Schill, L. (2007). *Critical Incidents for Intercultural Communication: An Interactive Tool for Developing Awareness, Knowledge, and Skills*. Norquest. Retrieved from <https://www.norquest.ca/NorquestCollege/media/pdf/centres/intercultural/CriticalIncidentsBooklet.pdf>

ON MANAGING AND FACILITATING PROCESSES

A comprehensive set of group management and project management tools, ready to be transferred into practice, can be found at:

<https://www.mindtools.com>



Reflections on lessons learnt in the plenary and final project presentations

GLOCAL TRANSATLANTIC RESEARCH PROJECTS

In four modules (2.5 semesters long, 20 ECTS) students, together with community experts and practitioners, undertook small research projects focusing on different issues of urban sustainability, for example, urban gardening initiatives and the sharing economy, or retrofitting public spaces in urban neighborhoods. Students formed small transatlantic teams with two coaches, one from each university. They developed the research topic, produced a research prospectus, conducted the research, wrote a final project report, and gave a public presentation. The kick-off and final wrap-up were face-to-face, all other project collaboration happened digitally. The team had weekly coaching and weekly self-organized team meetings.

What expertise did we need and who was there?

As already touched upon, instructors in their role as coaches introduced material the student team then researched using appropriate methods and sources. One coach of each team monitored and taught students about group dynamics, project management, and conflict management. The coaching team consisted of one instructor from each university. They managed the local engagement with community experts and practitioners, were knowledgeable about each other's academic system, but also actively integrated their own intercultural perspective. Guest lecturers brought in expertise for working in participatory settings, software skills, and training for the students and coaches in collaborative working.

Student groups had interdisciplinary backgrounds, and by the time they started in their project teams they were third semester students. They chose the

project group based on interests developed in previous classes. They had diverse backgrounds and in previous classes had all developed a good knowledge of the topics, having already discussed them and connected them to their own disciplines.

What were the types of roles we needed in the environment?

The research projects stood or fell with the coaches who mentored the students through the entire research process, guiding them to a successful output, and keeping them motivated. In order to keep the class feeling as a whole unit—despite the many smaller teams with different tasks—the integrator facilitated and hosted skill sessions on software, presentation, and feedback for everyone regardless of their research topic.

When did we need what kind of processes to facilitate student collaboration?

The student teams had important collaboration measures in place including building a code of conduct and communication agreement in a coached process and a trust-building activity where everybody was able to communicate their own work styles and other needs. Most of these processes were transferred into work that became part of the student assessment. For example, the code of conduct was part of the research prospectus, and the milestone planning was part of status update presentations. In addition to their research results, each student created a portfolio with what they considered as part of their new knowledge, resources they want to transfer to other settings, etc. and presented this to each other as part of their final coaching meetings.

Global Classroom Example 18 Glocal transatlantic research projects



3.3 VIRTUAL AND REAL IN THE GLOCAL TEACHING-LEARNING ENVIRONMENT

The schedule for today's class was tightly packed. For the first time the professor was trying out a new huge online collaboration tool. Students were looking forward to the first virtual collaboration with students from the other university. The plan was to build small teams and talk about the latest assignment and its results. Everybody seemed to have good computer skills and so there wasn't much that could go wrong. The students were eager to get connected, and they all came on time with their laptops. But then one student had a tablet that wasn't compatible with the software, and two more students didn't have sound. The professor had been explaining the guiding questions for the virtual group work activity and had to stop and tell the class how to install a Java plugin. Finally, everybody was connected. But suddenly there was a piercingly loud echo in the classroom. When that problem was solved there were only 5 minutes left for the task, and half the students were still dealing with the unfamiliar upload function while the other half had found the chat room and was sending smilies to everybody. The wrap-up was postponed to the next class.

We can all imagine something like this happening, and in this chapter we want to prevent that by giving you some ideas on how to deal with the third part of the glocal teaching-learning environment: virtual and real.

We understand real and virtual space as the fading away of physical obstacles in long distance communication. Online digital work is location-independent; it gives a group of local learners access to a global community. And this access to an incredible diversity gives students the opportunity to build up critical kinds of knowledge by tapping into heterogeneous topics of global relevance while still being connected to their local environment.

Fading physical obstacles

So we can now see how strongly this third part is connected to the global-local and collaboration-relationships dimensions. The e-learning space is an open learning space that allows students to adapt it to their own personal needs, which following constructivist learning theories is a perfect condition for competence development. E-learning tools and Web 2.0 technologies are possible first points of contact with a global and intercultural reality, allowing something like internationalization to take place at home. This is important because there are many reasons—for example, financial or personal—why students are unable to go on a semester abroad. A university's internationalization efforts can be advanced by creating a space for virtual mobility in which students connect with international communities, develop contacts to international researchers, and develop intercultural competencies (Barth & Burandt, 2013; Cörvers, Leinders, & van Dam-Mieras, 2011). This is not to say that virtual mobility should replace real mobility involving actual personal relationships, transnational study trips, or student exchange programs. On the contrary, their importance should not be underestimated in the digital (and artificial) age.

Connected to collaborations

Student mobility

Another essential task is to foster student competence to find their own way of using and organizing virtual space and navigating their way through the digital-

ized world and its workplaces. A knowledge society requires digital literacy, and students must learn to be critical about sources, software, commercialization, social media, and big data. For the instructor, these new opportunities for interaction require advanced text-based communication skills; they require careful planning to translate contents into the right environment, to choose appropriate tools, and to make use of technology in a meaningful way.

Three major topics

There are three major topics you will want to consider when planning your own virtual and real spaces in the glocal environment: (a) e-learning settings, (b) expertise, preparation, and training for students and instructors, and (c) software. The following sections give more detail about background and methods, and the last section gives a checklist that serves as a planning tool.

3.3.1 E-learning, Blended Learning, and Virtual Settings

MOOC

In the past, the digital enhancement of learning environments involved the use of computer-based tests and online quizzes. Massive open online courses (MOOC) are one extreme example of purely distributed, technology-enhanced learning, potentially offering endless scaling of the number of participants, outreach, and content repetition. However, the high number of drop-outs proves there is a downside to MOOCs, and we now observe a growing interest in converging online settings with traditional face-to-face settings (Vogt, Bellina, & John, 2016).

Blended learning

Research into e-learning environments provides us with a better understanding of their use and purposes. The open environment character of e-learning ties into constructivist learning approaches that call for the individual design and use of the learning environment. The preferred model today is blended learning, which combines the real and the virtual dimension, human face-to-face interaction in a technologically enhanced setting. It takes the best from both worlds (Bonk & Graham, 2006) and changes the focus from content back to the learning activity.

For the glocal teaching-learning environment, it is important to consider a variety of blended learning options and design them carefully. Here are some reference points for the design that are valid for synchronous virtual learning in transnational collaboration:

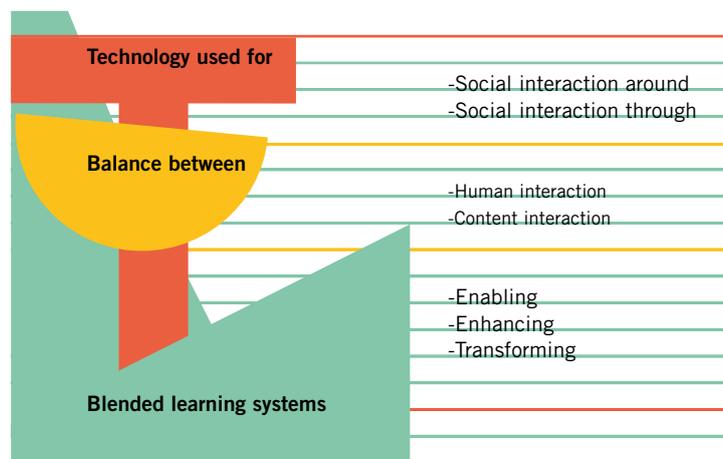


Figure 25 Options for virtual setting and designs

- There are three kinds of blended learning systems. Blended learning can enable by offering better and easier access to the same learning experience through an e-learning mode. Blended learning can also enhance or intensify the learning experience by means of new software and management systems. And blended learning can transform by providing more and different types of learning experiences that are not possible in traditional-face-to-face settings (Bonk & Graham, 2006; Schulmeister, 2002).
- There are three ways to use technology in the blended learning process, and these are not mutually exclusive. First, it can prompt individual interaction with the technology; second, it can initiate social interaction around the technology (e.g. collaborating around screens); and, third, it can serve as a medium through which social interaction takes place. An effective design uses these different ways consciously and selects what is most appropriate (Howard-Jones et al., 2015).
- Traditional settings tend to concentrate on human-to-human interaction, whereas distributed settings focus on human-material (or human-content) interaction. It is a matter of balancing the right design of these two relationships. Both human interaction and content interaction can be designed to engage learners. These two categories are largely influenced by synchronous or text-based communication, by synchronous work environments, and by a motivational, functional, blended-learning setting (Stein & Graham, 2014).

Three kinds of blended learning

Three ways of technology use

Two types of interaction

BLENDED LEARNING SCENARIOS

Setting	Face-to-face (classroom or in the local community)			
	Stimulus from webpages/ module material	Stimulus around online communication platforms	Stimulus through dynamic changes with virtual tutorials or seminars (flipped classroom)	
Modus	Instructional	Interactive	Coached tutorial	Coached problem-oriented project groups
Functions of virtual technology (Human interaction)	Asynchronous (email)	Asynchronous (email)	Asynchronous communication (whiteboard, message board, forum)	Synchronous communication (chat, video conference and other methods)
Functions of virtual technology (Content interaction)	Asynchronous one-way information flow (web-based information and data download)	Asynchronous bilateral information exchange (up- and download by students)	Synchronous work system (simultaneous document handling)	Synchronous work system (simultaneous document handling, work organization, management)
Categories of blended learning systems	Enabling blends	Enhancing blends		Transforming blends
Scenarios	Scenario 1	Scenario 2	Scenario 3	

Background Box 20 Blended learning scenarios

Switching between scenarios	In a competence-driven teaching-learning environment with a glocal dimension, there is a need for collaborative, synchronous work and communication, a learning management system, and options enabling individual learning styles. It is also possible to switch between different blended learning settings and scenarios during the semester or the program, and adapt these according to contents or the needs of students on either side of the transnational collaboration.
Formats	Additionally, you may want to consider both presence time in class and preparation time between classes in both scenarios. Formats such as flipped classrooms enormously increase interaction and synchronous work during presence time. Teaching videos can be a substitute for lectures during the seminar. Shared transnational preparation for presentations and short presentations during class time engage both student groups equally. Fieldwork produces data, and once uploaded it is available to everybody. Note that this environment may call for you as an instructor to relinquish some control.

EXEMPLARY FORMATS IN A BLENDED LEARNING ENVIRONMENT

FORMATS	DESCRIPTION
Teaching videos	Brief videos (ca. 10min) or input via PowerPoint slides replace in-class lectures. Students are able to repeatedly listen to and watch input.
Flipped classroom setting	Video or other material is prepared by students before class. Students prepare summary sheets, in-class discussion questions, and literature tips.
Breakout groups	Breakout groups help start discussions or break up lengthy talks. 2-3 people sitting together confer for brief periods (30 sec – 1min) before reporting results to the main group.
Transnational presentations	Transnational tandem teams of one student from each university give short presentations (5-10min) in plenary in-class sessions via videoconferencing. Together, the tandem team leads the discussion. Students learn to move within the digital environment. In both classrooms, a student takes on the role of an expert.

Background Box 21 Exemplary formats in a blended learning environment

3.3.2 Expertise, Preparation, and Training for the Virtual

Setting

Blended learning approaches are challenging for local and remote students—and for instructors as well. By taking these challenges into consideration from the very beginning and planning for appropriate training and expertise-building, you can avoid many of the obstacles the virtual environment presents.

Knowledge about and experiences with blended learning need to be assessed during the planning process for both instructors and, especially at the very beginning, for students. Both parties will need similar expertise and skills, so training can overlap. You will need the following expertise in your teaching team and among the students:

- technology, software, and hardware
- moderation, presentation, and virtual asynchronous communication
- digital literacy
- motivation
- management skills to connect virtual activities in the learning process

TECHNOLOGY INFRASTRUCTURE

Planning, buying, and setting up (especially on a daily basis) the necessary technological infrastructure can be an additional burden if there is no technical support from the university. Sufficient bandwidth is vital for uninterrupted communication, whether you are setting up point-to-point or point-to-multipoint connections. Other considerations, which have an impact on program cost, include whether you are teaching in an active-learning classroom (a traditional classroom for digitally-enhanced teaching and learning) or a mobile-learning classroom (where student's personal electronic devices and a mobile video conferencing system are used on any location). Training may be necessary for instructors to work in what may be for many a new environment. We recommend:

Types of classroom

- a technician or student assistant to help with the set-up, adjust the sound system during class, and troubleshoot software and hardware problems
- a standard camera angle and a floor mark to show where presenters should stand so as to be seen by both the remote and the local audience. A standard protocol for set-up and testing should include ongoing minutes about trouble-shooting.
- updates and upgrades of software, licenses to ensure connectivity, functionality, and compatibility of all hardware and software
- training on all technology used in the classroom for all instructors and students to ensure successful use

PRESENTATION, MODERATION, AND COMMUNICATION

Audience and direction

Instructors as well as students need to be conscious of the positioning of cameras. The presenter should also avoid focusing solely on the remote students (projected on the wall) and speak to the audience in the room as well. When moderating a discussion, it is also important to keep both local and remote students in view so that everyone is able to participate. Audio quality can affect speech intelligibility due to weak bandwidth or other technical issues such as echoing. During a teleconferencing session, you should check for understanding on a regular basis (“Got that?” or “Was that clear?” etc.). We recommend:

- sharing moderation responsibilities on each side of the camera to keep the discussion lively
- improving presentation skills through training (also for experienced presenters), including body language
- having a schedule for class with clear responsibilities
- developing communication policy standards, including an emergency strategy in case of loss of connection (e.g. text-based communication)

PROMOTING DIGITAL LITERACY

Digital critical thinking

To move confidently and effectively in the virtual and real environment, participants need to be digitally literate. Instructors, students, as well as outside experts and practitioners will already have a degree of digital literacy, but it should be developed through targeted training. These competencies revolve around three terms: explore, publish, and debate. Exploring means being able to find and evaluate information effectively and ethically. Publishing content such as videos or blogs involves not only developing technical skills but also being able to work collaboratively. And debating content helps strengthen a critical understanding of the information we are flooded with on a daily basis. We recommend:

- creating an awareness of different types of digital literacy, and their need for all participants
- evaluating digital literacy among participants
- using a targeted approach to select software for collaboration in the global teaching-learning environment, giving students options to increase their digital literacy

MOTIVATION

It is hard to equally involve students in e-learning settings. Even more than in face-to-face settings, students who are confident (and possibly have dominant personalities) receive more attention from instructors. In text-based communication, different personalities and learning styles mean that some students are marginalized because they need more time to formulate answers or questions or are insecure handling technology. This can lead to frustration, and withdrawal, or in extreme cases even to dropping out entirely. It can also lead to so-called “lurking” on the fringes of the shared learning environment instead of actively participating.

Motivation is also influenced by the length and pace of teaching, a topic we address in the following section. We recommend:

Prevention of lurking

- ensuring students can readily participate in online environments. Take time for online socialization in which students learn social and collaborative skills allowing them to all participate in a virtual environment.
- valuing student contributions and discussion, as well as the time and effort this environment needs. You may need to help contextualize, connect, and guide student contributions.

LENGTH AND TEACHING PACE

The virtual teaching-learning environment, blended learning, and transnational collaboration challenge traditional classroom planning on all fronts, making it difficult to organize a seamless interaction between class activities. Additional class time and energy are needed to encourage both geographically remote and local students. Also, discussions and collaboration between the two groups may take more time than usual. You may have to initiate or facilitate communication, especially in the first weeks of the module or the program. We recommend

Timing, pace, and duration

- using schedules for synchronous planning between both transnational partners
- planning “wobble room” between activities and technology set-ups
- having a collection of “mini-activators” to deal with chattering, silences, and awkward situations

Module: 2 – Class Feb 12, 2015 Transformational Sustainability Research

Material: Flipchart, markers ...

Instructors: Instructor 1 (University A), Prof 2 (University B)

Timing: for 90 min; 14:00-15:30

ACTIVITY	ACTORS	LENGTH	STARTING TIME
<i>Preparation of room and video conferencing, connecting</i>	<i>Student assistant</i>	<i>30 min</i>	<i>13:30</i>
<i>Welcome, introduce goals and activities</i>	<i>Instructor 1 Uni A</i>	<i>5 min</i>	<i>14:00</i>
<i>10 min presentation “Transdisciplinarity” (Upload and open presentation)</i>	<i>Student 1 (Uni A) and Student 2 (Uni B)</i>	<i>15 min</i>	<i>14:05</i>
<i>Q&A from students, discussion</i>	<i>Moderation: Instructor 1(Uni A) Instructor 2 (Uni B)</i>	<i>10 min</i>	<i>14:20</i>

Global Classroom Example 19 Time sheet for planning joint classes

3.3.3 Setting up Technology, Software, and Equipment

Overview of equipment

With so many different digital tools to choose from, it is easy to get carried away. This is all the more reason to keep in mind what you need the equipment for. In this section, we provide you with a functional overview and examples of the components of digital literacy.

ACTIVE-LEARNING CLASSROOM OR MOBILE VIRTUAL CLASSROOM

Some universities are fortunate to have very good video conferencing facilities with access to a high-end technology infrastructure. An active-learning classroom is a permanent facility equipped with computers, projectors, white boards, software, as well as IT support. These rooms are sometimes quite popular and are often overbooked. For universities less well endowed, a mobile virtual classroom, which is portable and simple to set up, may be a practical alternative.

See Figure 26

A mobile virtual classroom can be set up in any classroom. Move tables into a V-shape for whole class activities or use individual tables for small groups. Set up a station with a computer, camera, video, audio, and projector. This station is usually not visible in video conferencing for the remote participants.

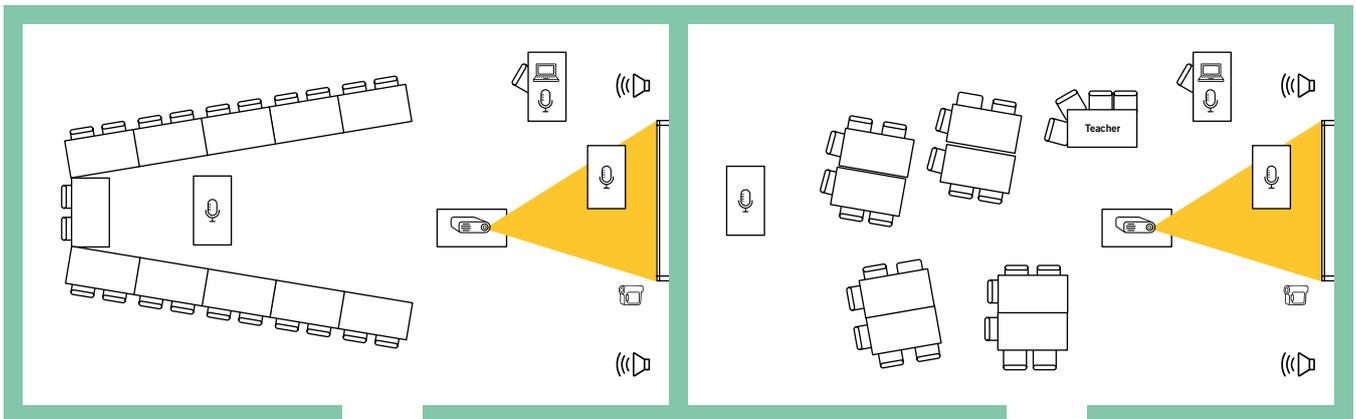


Figure 26 Standard video conferencing set-ups in a mobile virtual classroom

BYOD4L, this abbreviation is not only a clue to the mobile virtual classroom set-up, but also for many web-based apps. *Bringing your own device for learning* is practical, but it is more than that. It is a grass-root movement in education, where existing resources of students are purposefully integrated into classroom learning. Most, but not all, web-based applications and social media are compatible on tablets, computers, and smartphones. Be also aware of the need for updates.



For the video set-up you will need

- ❖ Computer, keyboard, mouse
- ❖ HD Web camera
- ❖ Tripod
- ❖ HD projector + adapter
- ❖ Extension cables (USB, power, LAN)

For the audio set-up you will need

- ❖ Headset and adapter
- ❖ External audio speakers
- ❖ Handheld microphones (2-4)
- ❖ Rechargeable batteries
- ❖ Mixing control desk unit
- ❖ Headsets for students in group work

Worksheet 19 Technology checklist for the mobile virtual classroom

DELIVERY OF MATERIALS AND RESOURCES

At the heart of the virtual classroom is a learning management system that statically connects students and instructors. As most communication is asynchronous, users have access anytime anywhere. Visual, audio, text media—learning material but also assignments and evaluations—can be uploaded and downloaded by all participants, although instructors and students will typically have different levels of access.

Learning management system

VISUALIZATION, ANIMATION, AND SIMULATION

Videos and photos offer new ways to produce and visualize content. Teaching material can include videos from sources such as YouTube, Vimeo, or TedX. But students are also able to produce and process their own content. Animation can also be used in virtual learning instead of static graphics to help learners understand and remember information. Furthermore, simulation games can be used as an exploration tool in geography. Game-like elements (gamification) are becoming increasingly popular in learning apps as they promote student involvement and motivation. 3D SIMS-like interfaces represent a simplified version of reality and immerse students in a virtual reality.

Using and producing

COMMUNICATION AND COLLABORATION

There are countless options for bridging the distance between learners and instructors in virtual environments. Text-based communication is important even when collaborating synchronously. Plenary communication is facilitated through video-conferencing software, while in-class instant messaging such as Twitter allows all participants to react immediately, e.g. in asking questions. Instant messaging is very helpful during real-time collaboration for organizing, coordinating, and updating each other. More complex tools can integrate video conferencing with other collaboration tools like online whiteboards and chats.

Enhanced communication

CONTENT CURATION TOOLS AND PUBLICATION (VISUALIZATION AND ANIMATION)

Ways of publishing

Content curation helps to structure and process contents so that they are adapted to different learning styles. It is text and visual-based, real-time but also static. Content curation tools can be used to create and build individual or collective stories, as well as engage in reflection or transfer activities. Visual bookmarking is a relatively simple tool. More systematic approaches to organize content involve conceptual maps, mind maps, or flow charts. Blogging and writing wikis are an option to develop a shared knowledge base and train publishing skills (e.g. writing routines, addressing target groups, and achieving outreach). Finally, digital portfolios allow students to individually combine several media and sources into a new source or story.

STRUCTURED WORK PROCESS AND COLLABORATION

Project management

In project-based work, shared work processes can be tracked using web-based tools for project management, task distribution, and scheduling. Content curation tools can also help to structure or design processes. Cloud-based storage space, which can be integrated in learning management software (LMS), is useful for ongoing documentation of progress or student outputs.

OPEN ACCESS AND OPEN EDUCATIONAL RESOURCES (OER)

Open access resources

This community offers free access to research publications and educational resources, which can in turn be adapted and further developed. There are incredible opportunities and advantages here to learn from best practice. Accessing these materials also means critically reflecting on sources and quality criteria. The materials should align with your intended learning outcomes and serve to develop competencies among your learners.

VOICES FROM THE INSTRUCTIONAL DESIGN TEAM, IRMA SANDERCOCK AND ANDREW ELLS FROM ARIZONA STATE UNIVERSITY:

The Instructional Design Team in the College of Liberal Arts and Sciences was tasked with supporting the Global Classroom at ASU project by providing instructional design and technology expertise for developing a hybrid teaching-learning environment. The project offered a unique opportunity for the College to showcase how technology can support teaching and learning across time and space.

Based on our experiences we can recommend the following instructional strategies

- Set expectations for participation beforehand. Provide students with procedural information on how and when students should participate in class discussions. Make sure students are aware of the capabilities of the technology being used.
- Use pre-class study questions and advance organizers to encourage critical thinking and informed participation on the part of the learners during synchronous sessions.
- Include participants in activities within the first five minutes of the first class.
- Engage students with variety and interaction in every session. Consider using games, interactives, and group work to keep interest high.
- Change the pace of activities frequently to keep learners' attention.
- Schedule no more than 10-15 minutes of instructor talk without some learner-centered response.
- Use voting or choice tools to increase interaction during sessions.
- Consider having students use some type of back-

channel site or chat tool for questions during class discussions.

- Begin question and answer segments with questions at the recall or understanding level that can be answered easily to get discussions off the ground quickly.

The work in the Global Classroom project showed us that designing a learning experience for this specific situation can become very similar to designing any learning experience when we overcome the challenges.

One of those was coordinating synchronous sessions across multiple time zones and determining the most appropriate technology so that the transatlantic teams could engage in discussions and work on projects. Ultimately a mix of video-conferencing, chat and collaborative software as well as audio-visual equipment was selected to meet the design goals for the project. It was impressive to see the sense of community generated by additional collaborative and social media tools when the students finally met for face-to-face sessions. “We no longer have boundaries to the classroom,” says Charles Kazilek, associate dean of technology, media and communications in the College of Liberal Arts and Sciences (Agnihotri, 2014).

Global Classroom Example 20 Voices from the instructional design team, Irma Sandercock and Andrew Ells from Arizona State University

SOFTWARE OPTIONS FOR HUMAN-CONTENT INTERACTION

Delivery	Moodle https://moodle.org Blackboard http://de.blackboard.com/sites/international/globalmaster/ Coursesites https://www.coursesites.com/webapps/Bb-sites-course-creation-BBLEARN/pages/index.html Wordpress https://en.wordpress.com Tumbler https://www.tumblr.com Blog https://blogger.com
Visualization	Screenflow http://www.telestream.net/screenflow/ Google Maps and Google Earth GPS tracking Runkeeper etc. Gamification http://top5onlinecolleges.org/gamification/ http://www.gamesforchange.org/learn/
Communication and collaboration	Video conferencing software Vydio, Google Hangout, Skype Instant messaging Facebook, WhatsApp, Slack, Telegram, Twitter Web conferencing with interaction Adobe Connect http://blindsidenetworks.com



Content Curation**Bookmarking**Pinterest <http://pinterest.com>Google Keep <http://keep.google.com>**Mapping**

Lucidchart

Mindmeister

cMaps <http://cmap.ihmc.us> & <http://www.tiki-toki.com>**Reflection**<https://www.digication.com><https://twinery.org><https://storify.com>**Blogging, recording**

Wiki, WordPress, Google Blog,

Media wiki <http://www.mediawiki.org>)

Structuring work processes**Project management**Asana, Trello, <https://wedoist.com>**Mapping**

Lucidchart

Mindmeister

cMaps

Workspace

Google Drive, Dropbox,

ownCloud.com

Open educational resourceshttp://wikieducator.org/Main_Page<https://blended.online.ucf.edu><https://www.wikiversity.org><http://ocw.mit.edu/index.htm>

Background Box 22 Software options for human-content interaction

3.3.4 How to Establish your Virtual and Real Settings in the Glocal Teaching-Learning Environment

This checklist guides you step by step through planning virtual and real settings in a glocal teaching-learning environment.

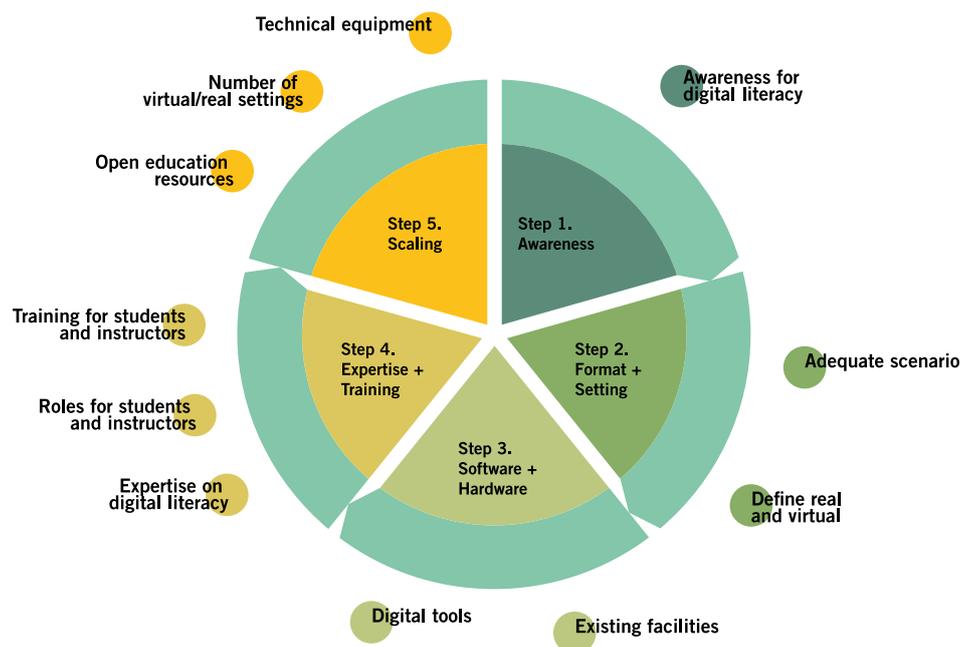


Figure 27 Overview: how to plan a virtual and real set-up

STEP 1: AWARENESS

- What is the level of awareness and the knowledge base in your team? Concerning digital literacy? Big (social) data use?

STEP 2: WHAT FORMAT AND SETTING WILL YOU NEED?

What is the appropriate scenario for your blended virtual-real setting?

- How do you define “real”?
 - What activities and formats will constitute your real environment?
 - How will students interact in that environment?
- What will happen virtually?
 - What activities and formats will constitute your virtual environment?

- What interactions will be asynchronous?
- What activities need to be synchronous?
- How (activities) will students interact with content?
- How will students and instructors interact with each other?
- What are the expected costs of this environment (personnel, software, and technical equipment)?

STEP 3: WHAT SOFTWARE TOOLS AND TECHNICAL EQUIPMENT WILL YOU NEED?

- What is the existing infrastructure at your institution that you can build on?
- What is a realistic scheduling of classes and activities?
- What is a realistic scheduling for instructor preparation?
- Which tools will you use for providing local and remote students with materials?
- Which tools will you use for communication? In class? In collaborative work?
- Which tools (audio and visual) will you use to provide contents?
- Which tools will you use for content curation?
- Which tools will you use to integrate critical student reflection?
- Which tools will you use to structure collaboration and the work process?
- Are there any open access education resources that you can recycle?

STEP 4 WHAT EXPERTISE AND TRAINING WILL YOU REQUIRE?

- How digitally literate is your team?
- How digitally literate are your students?
- Who in your team is taking on which tasks and roles for the virtual environment?
- What kind of training is necessary for moderation, communication, presentation, etc.?
- What is your strategy for introducing the technology to your students?

STEP 5 HOW TO SCALE AND ADAPT?

The resources (financial, time, and personnel) we have at our disposal affect how we can use virtual and real environments.

- The number and types of real interaction, including those supporting virtual mobility and internationalization, can be restricted or expanded.
- Active learning classroom and mobile classroom settings can be used.
- Communication channels and tools can be limited, as can experimentation with the application. This means less training and management as well as fewer software licenses.
- Instead of producing resources yourself, see what can be found in the open education resource (OER) community and try to adapt and recycle—and share what you create yourself.

Check ✓	<input type="checkbox"/> awareness among instructors/need for training <input type="checkbox"/> expertise and knowledge level of students <input type="checkbox"/> intercultural training for instructors <input type="checkbox"/> organizational structure for the instructor team <input type="checkbox"/> relationship to curriculum evaluation			
Describe blended learning scenario ✍				
	Real	Virtual		
Human interaction ✍	[Specify modules, schedule]	[Specify modules, schedule]		
Content interaction ✍	[Specify modules, schedule]	[Specify modules, schedule]		
Needs analysis	Tools, including software	Infrastructure, including hardware	Personnel, including administrative	Est. cost
Communication and collaboration ✍				
Content curation ✍				
Critical reflection ✍				
Material delivery ✍				
Visualization ✍				
Work processes ✍				
Open educational resources ✍				
Training ✍				
For who ✓	<input type="checkbox"/> Student <input type="checkbox"/> Instructor	<input type="checkbox"/> Student <input type="checkbox"/> Instructor	<input type="checkbox"/> Student <input type="checkbox"/> Instructor	
By whom ✍				
	Total estimated costs			

3.3.5 Further Reading

Both these books are handbooks for blended learning. They combine more background information and theory, but also include many helpful checklists to manage the blended learning environment.

Bonk, C. J. & Graham, C. R. (2006). *The Handbook of Blended Learning: Global Perspectives, Local Designs*. John Wiley & Sons.

Stein, J. & Graham, C. R. (2014). *Essentials for Blended Learning: A Standards-Based Guide*. Routledge.

VIRTUAL AND REAL SET-UP



Active learning classroom vs. mobile virtual classroom



Our Global Classroom on the German side of the collaboration took place in a mobile virtual classroom setting relying on student laptops as part of the technical equipment. The IT facilities provided mainly the technical equipment.

What was the setting you needed?

The real component in the blended learning setting was the local classroom and activities conducted in small and big teams in the local community. Furthermore, study trips to both universities allowed a real, personal connection between the students. The virtual component comprised big plenary settings and discussions in shared class time, transnational small team presentations, and responsibilities to work in transnational virtual teams outside class.

The strong focus on collaborative work often required synchronous settings with real-time communication and real-time work on shared work. A flipped classroom approach was used to focus on human interaction in class time, while content interaction was outside shared class time.

What software tools and technical equipment were used?

Careful shared planning of classes, strict scheduling, and shared responsibilities during class were the key to smooth interaction in the virtual environment. Roles and responsibilities were clearly distributed, e.g. one person taking on the input for the activity, another taking on the wrap-up, and a third the explanations for next week's assignment. Slack time was always necessary to deal with technical issues and troubleshooting.

What were the tools for content curation?

The shared learning management system was based on Blackboard, which showed class content and assignments, tracked uploads, and offered a standard forum for exchange. Another successful tool for synchronous collaboration was Adobe Connect, which students used to share and compare results of the transect walk activities they conducted outside class in their home environment. Another interesting tool was Digication, which students used towards the end of the module to produce individual portfolios, creating their own story and connecting it to their own knowledge base.

Global Classroom Example 21 Virtual and real set-up

REFERENCES

- Abualrub, I., Karseth, B., & Stensaker, B. (2013). The various understandings of learning environment in higher education and its quality implications. *Quality in Higher Education*, 19(1), 90–110. <https://doi.org/10.1080/13538322.2013.772464>
- Adams, M., Bell, L. A., & Griffin, P. (eds. (2007). *Teaching for diversity and social justice* (2nd ed.). New York.
- Agnihotri, I. (2014). Classroom lessons go global at ASU through technology. Retrieved September 20, 2016, from <https://asunow.asu.edu/content/classroom-lessons-go-global-asu-through-technology>
- Agyeman, J. (2005). Sustainable Communities and the Challenge of Environmental Justice. *American Planning Association Journal of the American Planning Association*, 39(September), 256. <https://doi.org/10.1177/0094306109356662>
- Agyeman, J. (2013). Introducing just sustainabilities. In *Introducing just sustainabilities: Policy, planning and practice* (pp. 4–58).
- Altbach, P. G., & Knight, J. (2007). The Internationalization of Higher Education: Motivations and Realities. *Journal of Studies in International Education*, 11(3–4), 290–305. <https://doi.org/10.1177/1028315307303542>
- Bammer, G. (2013). *Disciplining Interdisciplinarity*. Canberra, Australia: ANU E Press.
- Barkley, E. F., Cross, K. P., & Major, C. H. (2005). *Collaborative Learning Techniques: A Handbook for College Faculty*. The JosseyBass Higher and Adult Education Series (Vol. 1).
- Barnett, R. (2000). Supercomplexity and the Curriculum. *Studies in Higher Education*, 25(3), 255–265. <https://doi.org/10.1080/713696156>
- Barnett, R., & Coate, K. (2005). *Engaging the Curriculum in Higher Education*. *International Studies in Sociology of Education*. Bershire: Open University Press. <https://doi.org/10.1080/0962021980020157>
- Barnett, R., Parry, G., & Coate, K. (2001). Conceptualising Curriculum Change. *Teaching in Higher Education*, 6(4), 435–449. <https://doi.org/10.1080/13562510120078009>
- Barth, M. (2013). Many roads lead to sustainability: a process-oriented analysis of change in higher education. *International Journal of Sustainability in Higher Education*, 14(2), 160–175. <https://doi.org/10.1108/14676371311312879>
- Barth, M. (2015). *Implementing Sustainability in Higher Education*. *Learning in an age of transformation*. New York: Routledge.

- Barth, M., & Burandt, S. (2013). Adding the “e-” to Learning for Sustainable Development: Challenges and Innovation. *Sustainability*, 5(6), 2609–2622. <https://doi.org/10.3390/su5062609>
- Barth, M., Godemann, J., Rieckmann, M., & Stoltenberg, U. (2007). Developing key competencies for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 8(4), 416–430. <https://doi.org/10.1108/14676370710823582>
- Barth, M., & Michelsen, G. (2013). Learning for change: an educational contribution to sustainability science. *Sustainability Science*, 8(1), 103–119. <https://doi.org/10.1007/s11625-012-0181-5>
- Battisti, B., Passmore, C., & Sipos, Y. (2008). Action learning for sustainable agriculture: Transformation through guided reflection. *Nacta Journal*, (June).
- Bielaczyc, K., & Collins, A. (1999). Learning Communities in Classrooms: A Reconceptualization of Educational Practice. *Instructional Design Theories and Models, II*, 269–292. <https://doi.org/10.1177/019263659908360402>
- Biggs, J. (1993). From Theory to Practice: A Cognitive Systems Approach. *Higher Education Research and Development*, 12(1), 73–85. <https://doi.org/10.1080/0729436930120107>
- Biggs, J. (1996). Enhancing Teaching through Constructive Alignment. *Higher Education*, 32(3), 347–364.
- Biggs, J., & Tang, C. (2007). *Teaching for Quality Learning at University*. Bershire: Open University Press.
- Blackshields, D., Cronin, J., Higgs, B., Kilcommins, S., McCarthy, M., & Ryan, A. (2014). *Integrative Learning: International research and practice*. Routledge, London.
- Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1969). Taxonomy of educational objectives: The classification of educational goals. New York, Toronto: Longmans, Green.
- Bonk, C. J., & Graham, C. R. (2006). *The Handbook of Blended Learning: Global Perspectives, Local Designs*. John Wiley & Sons.
- Boose, D., & Hutchings, P. (2016). The Scholarship of Teaching and Learning as a Subversive Activity. *Teaching & Learning Inquiry The ISSOTL Journal*, 4(1), 1–12. <https://doi.org/10.20343/teachlearninqu.4.1.6>
- Bormann, I., & De Haan, G. (2008). *Kompetenzen der Bildung für nachhaltige Entwicklung : Operationalisierung, Messung, Rahmenbedingungen, Befunde*. <https://doi.org/10.1007/978-3-531-90832-8>
- Borrego, M., & Newswander, L. K. (2010). Definitions of Interdisciplinary Research: Toward Graduate-Level Interdisciplinary Learning Outcomes. *The Review of Higher Education*, 34(1), 61–84. <https://doi.org/10.1353/rhe.2010.0006>

- Bowers, C. A. (2002). Toward an Eco-justice Pedagogy. *Environmental Education Research*, 8(1), 21–34. <https://doi.org/10.1080/13504620120109628>
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How People Learn: Brain, Mind, Experience and School (Expanded Edition)*. Washington, DC, USA: National Academies Press.
- Brockbank, A., & McGill, I. (2004). *The Action Learning Handbook*. Routledge, London.
- Brundiers, K., & Wiek, A. (2011). Educating Students in Real-world Sustainability Research: Vision and Implementation. *Innovative Higher Education*, 36(2), 107–124. <https://doi.org/10.1007/s10755-010-9161-9>
- Brundiers, K., & Wiek, A. (2013). Do We Teach What We Preach? An International Comparison of Problem- and Project-Based Learning Courses in Sustainability. *Sustainability*, 5(4), 1725–1746. <https://doi.org/10.3390/su5041725>
- Brundiers, K., Wiek, A., & Kay, B. (2013). The Role of Transacademic Interface Managers in Transformational Sustainability Research and Education. *Sustainability*, 5(11), 4614–4636. <https://doi.org/10.3390/su5114614>
- Brundiers, K., Wiek, A., & Redman, C. L. (2010). Real-world learning opportunities in sustainability: from classroom into the real world. *International Journal of Sustainability in Higher Education*, 11(4), 308–324. <https://doi.org/10.1108/14676371011077540>
- Butin, D. W. (2005). *Service-Learning in Higher Education. Service Learning* (Vol. 119). <https://doi.org/10.1057/9781403981042>
- Caniglia, G., John, B., Kohler, M., Bellina, L., Rojas, C., Laubichler, M., & Lang, D. J. (2016). An experience-based learning framework. Activities for the initial development of sustainability competencies. *International Journal of Sustainability in Higher Education*, 17(4).
- Cörvers, R., Leinders, J., & van Dam-Mieras, R. (2011). Virtual seminars - or how to foster an international, multidisciplinary dialogue on sustainable development. In M. Barth, M. Rieckmann, & Z. Sanusi (Eds.), *Higher education for sustainable development: looking back and moving forward* (pp. 142–187).
- Cowan, J. (2012). ABC of action learning - By Reg Revans. *British Journal of Educational Technology*, 43(1), E38–E39. <https://doi.org/10.1111/j.1467-8535.2011.01274.6.x>
- Czollek, L., & Perko, G. (2012). *Praxishandbuch Social Justice und Diversity: Theorien, Training, Methoden, Übungen*. Belz Juventa.
- De Haan, G. (2006). The BLK “21” programme in Germany: a “Gestaltungskompetenz”-based model for Education for Sustainable Development. *Environmental Education Research*, 12(1), 19–32. <https://doi.org/10.1080/13504620500526362>

- Dede, C. (2006). Scaling Up. Evolving Innovations Beyond Ideal Settings to Challenging Contexts of Practice. In *Cambridge Handbook of the Learning Sciences*.
- Defila, R., & Di Giulio, A. (1998). Interdisziplinarität und Disziplinarität. In *Zwischen den Fächern, über den Dingen? Universalisierung versus Spezialisierung akademischer Bildung* (pp. 111–137). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-322-90935-0_6
- De Oliveira Andreotti, V. (2006). Soft versus critical global citizenship education. *Policy & Practise - A Development Education Review*, 40–51.
- De Oliveira Andreotti, V. (2014). Critical and transnational literacies in international development and global citizenship education. *SISYPHUS Journal of Education*, 2(3), 33–50.
- Dillenbourg, P. (1999). What do you mean by 'collaborative learning'? *Collaborative Learning Cognitive and Computational Approaches*, 1(6), 1–15. <https://doi.org/10.1.1.167.4896>
- Earl, L. (2003). *Assessment as learning: Using classroom assessment to maximize student learning*. books.google.com (2nd ed.). Thousand Oaks, CA: Corwin Press.
- Elkana, Y., & Klöpffer, H. (2016). *The University in the Twenty-first Century. Teaching the New Enlightenment in the Digital Age*. (M. Lazerson, Ed.). Budapest: Central European University Press.
- Fishman, B. J., & Davis, E. A. (2006). Teacher Learning Research and the learning sciences. In *Cambridge Handbook of the Learning Sciences* (pp. 535–550).
- Freire, P. (1996). *Pedagogy of the oppressed* (Rev. ed.). London: Penguin. <https://doi.org/10.1017/CBO9781107415324.004>
- Gandin, L. A., Apple, M. W., & Au, W. (Eds.). (2009). The Routledge international handbook of critical education. *Critical Education*. New York: Routledge.
- Goswami, U. (2006). Neuroscience and education: from research to practice? *Nature Reviews Neuroscience*, 7(5), 406–413. <https://doi.org/10.1038/nrn1907>
- Hesselbarth, C., & Schaltegger, S. (2014). Educating change agents for sustainability – learnings from the first sustainability management master of business administration. *Journal of Cleaner Production*, 62, 24–36. <https://doi.org/10.1016/j.jclepro.2013.03.042>
- Hiemstra, R. (1991). Aspects of effective learning environments. *New Directions for Adult and Continuing Education*, 1991(50), 5–12. <https://doi.org/10.1002/ace.36719915003>
- Hmelo-Silver, C. E. (2004). Problem-Based Learning: What and How Do Students Learn? *Educational Psychology Review*, 16(3), 235–266. <https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>

- Howard-Jones, P., Ott, M., van Leeuwen, T., & De Smedt, B. (2015). The potential relevance of cognitive neuroscience for the development and use of technology-enhanced learning. *Learning, Media and Technology*, 40(2), 131–151. <https://doi.org/10.1080/17439884.2014.919321>
- Huber, M. T. & Hutchings, P. (2004). Integrative Learning: Mapping the Terrain. *Carnegie Foundation*, 1–32. <https://doi.org/10.3928/00220124-20100624-04>
- Ivanitskaya, L., Clark, D., Montgomery, G., & Primeau, R. (2002). Interdisciplinary Learning : Process and Outcomes. *Innovative Higher Education*, 27(2), 95–111. <https://doi.org/10.1023/A:1021105309984>
- Jacoby, B. (1996). *Service-Learning in Higher Education: Concepts and Practices*. San Francisco: Jossey-Bass Publishers.
- Jerneck, A., Olsson, L., Ness, B., Anderberg, S., Baier, M., Clark, E., ... Persson, J. (2010). Structuring sustainability science. *Sustainability Science*, 6(1), 69–82. <https://doi.org/10.1007/s11625-010-0117-x>
- Jickling, B., & Wals, A. E. J. (2008). Globalization and environmental education: looking beyond sustainable development. *Journal of Curriculum Studies*, 40(1), 1–21. <https://doi.org/10.1080/00220270701684667>
- Johnson, A. G. (2002). Privilege, Power, and Difference. *Teaching Sociology*, 30, 266. <https://doi.org/10.2307/3211393>
- Jones, E., Coelen, R., Beelen, J., & Wit, H. de (Eds.). (2016). *Global and Local Internationalization*. Rotterdam: SensePublishers. <https://doi.org/10.1007/978-94-6300-301-8>
- Kagan, S. (2013). *Art and Sustainability : Connecting Patterns for a Culture of Complexity* (2nd ed.). Bielefeld: transcript Verlag.
- Klinsky, S., & Golub, A. (2016). Justice and Sustainability. In *Sustainability Science* (pp. 161–173). <https://doi.org/10.1007/978-3-319-02904-7>
- Knowles, E., & Elliott, J. (1991). Glocal. *The Oxford Dictionary of New Words*.
- Kolb, D. a, Boyatzis, R. E., & Mainemelis, C. (2000). Experiential Learning Theory: Previous Research and New Directions. *Perspectives on Thinking Learning and Cognitive Styles*, 1(216), 227–247. <https://doi.org/10.5465/AMLE.2005.17268566>
- König, A. (2015). Changing requisites to universities in the 21st century: Organizing for transformative sustainability science for systemic change. *Current Opinion in Environmental Sustainability*, 16, 105–111. <https://doi.org/10.1016/j.cosust.2015.08.011>
- Kosmutzky, A., & Putty, R. (2015). Transcending Borders and Traversing Boundaries: A Systematic Review of the Literature on Transnational, Offshore, Cross-Border, and Borderless Higher Education. *Journal of Studies in International Education*, 1–26. <https://doi.org/10.1177/1028315315604719>

- De Kraker, J. de, Lansu, A., & van Dam-Mieras, R. (2007). *Crossing Boundaries. Innovative Learning for Sustainable Development in Higher Education*. VAS, Frankfurt am Main, Germany.
- Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., ... Thomas, C. J. (2012). Transdisciplinary research in sustainability science: practice, principles, and challenges. *Sustainability Science*, 7(S1), 25–43. <https://doi.org/10.1007/s11625-011-0149-x>
- Leask, B. (2009). Using formal and informal curricula to improve interactions between home and international students. *Journal of Studies in International Education*, 13(2), 205–221. <https://doi.org/10.1177/1028315308329786>
- Linn, P. L., Howard, A., & Miller, E. (Eds.). (2004). *Handbook for research in cooperative education and internships*. Mahwah, NJ: Erlbaum.
- Lotz-Sisitka, H., Wals, A. E. J., Kronlid, D., & McGarry, D. (2015). Transformative, transgressive social learning: Rethinking higher education pedagogy in times of systemic global dysfunction. *Current Opinion in Environmental Sustainability*. <https://doi.org/10.1016/j.cosust.2015.07.018>
- Loyens, S. M. M., Magda, J., & Rikers, R. M. J. P. (2008). Self-directed learning in problem-based learning and its relationships with self-regulated learning. *Educational Psychology Review*, 20(4), 411–427. <https://doi.org/10.1007/s10648-008-9082-7>
- Martusewicz, R., Edmundson, J., & Lupinacci, J. (2015). *Eco-Justice Education: Toward Diverse, Democratic, and Sustainable Communities*. Routledge, New York and London.
- Massey, R. (2004). Just Sustainabilities: Development in an Unequal World. *Ecological Economics*, 49(4), 486–487. <https://doi.org/10.1016/j.ecolecon.2004.01.008>
- McArthur, J., & Sachs, J. (2009). Needed : a New Generation of Problem Solvers. *Chronicle of Higher Education*, 55(40), A64–A66.
- McGaw, B. (2003). Foreword. In D. S. Rychen & L. H. Salganik (Eds.), *Key Competencies for a successful life and well-functioning society* (pp. vii–ix). Cambridge, MA: Hogrefe & Huber.
- Miller, T. R., Wiek, A., Sarewitz, D., Robinson, J., Olsson, L., Kriebel, D., & Lorbach, D. (2013). The future of sustainability science: a solutions-oriented research agenda. *Sustainability Science*, 1–8. <https://doi.org/10.1007/s11625-013-0224-6>
- Moore, J. (2005). Seven recommendations for creating sustainability education at the university level: A guide for change agents. *International Journal of Sustainability in Higher Education*, 6(4), 326–339. <https://doi.org/10.1108/14676370510623829>
- O’Byrne, D., Dripps, W., & Nicholas, K. A. (2015). Teaching and learning sustainability: An assessment of the curriculum content and structure of sustainability degree programs in higher education. *Sustainability*

- Science*, 10(1), 43–59. <https://doi.org/10.1007/s11625-014-0251-y>
- O'Neill, G. (2015). *Curriculum Design in Higher Education: Theory To Practice*. Dublin: UCD Teaching & Learning.
- OECD, & CERI. (2008). *Understanding the Brain: the Birth of a Learning Science. New insights on learning through cognitive and brain science. OECD/CERI International Conference "Learning in the 21st Century: Research, Innovation and Policy."* <https://doi.org/10.1787/9789264029132-en>
- Redclift, M. (1993). Sustainable Development : Needs , Values , Rights. *Environmental Values*, 2(1), 3–20.
- Robertson, R. (1995). Glocalization: Time-Space and Homogeneity/Heterogeneity. In M. Featherstone, S. Lash, & R. Robertson (Eds.), *Global Modernities* (pp. 25–44). London: Sage Publications.
- Rowe, D., & Hiser, K. (2016). Higher education for sustainable development in the community and through partnerships. In M. Barth, G. Michelsen, M. Rieckmann, & I. Thomas (Eds.), *Routledge Handbook of Higher Education for Sustainable Development* (pp. 315–330). London: Routledge.
- Rychen, D. S. (2008). OECD Referenzrahmen für Schlüsselkompetenzen — ein Überblick. In I. Bormann & G. De Haan (Eds.), *Kompetenzen der Bildung für nachhaltige Entwicklung* (pp. 15–22). Wiesbaden: VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-90832-8_3
- Rychen, D. S. (2009). Key Competencies: Overall Goals for Competence Development: An International and Interdisciplinary Perspective. In *International Handbook of Education for the Changing World of Work* (pp. 2571–2583). https://doi.org/10.1007/978-1-4020-5281-1_169
- Rychen, D. S., & Salganik, L. H. (Eds.). (2001). *Defining and selecting key competencies*. Seattle: Hogrefe & Huber.
- Rychen, D. S., & Salganik, L. H. (Eds.). (2003). *Key Competencies for a Successful Life and a Well-Functioning Society*. Cambridge, MA: Hogrefe & Huber..
- Scholz, R. W., & Tietje, O. (2002). *Embedded Case Study Methods: Integrating quantitative and qualitative knowledge*. Sage Publications Inc.
- Schulmeister, R. (2002). Virtuelles Lehren und Lernen: Didaktische Szenarien und virtuelle Seminare. In B. Lehmann & E. Bloh (Eds.), *Online-Pädagogik* (pp. 129–143). Hohengehren: Schneider Verlag.z
- Sipos, Y., Battisti, B., & Grimm, K. (2008). Achieving transformative sustainability learning: engaging head, hands and heart. *International Journal of Sustainability in Higher Education*, 9(1), 68–86. <https://doi.org/10.1108/14676370810842193>

- Stauffacher, M., Walter, A. I., Lang, D. J., Wiek, A., & Scholz, R. W. (2006). Learning to research environmental problems from a functional socio-cultural constructivism perspective: The transdisciplinary case study approach. *International Journal of Sustainability in Higher Education*, 7(3), 252–275. <https://doi.org/10.1108/14676370610677838>
- Stein, J., & Graham, C. R. (2014). *Essentials for Blended Learning: A Standards-Based Guide*. Routledge.
- Stevenson, R., Brody, M., Dillon, J., Wals, A., & (eds.). (2013). *International Handbook of Research on Environmental Education*. (R. Stevenson, M. Brody, J. Dillon, & A. Wals, Eds.). Routledge, New York and London.
- Straka, G. A. (2000). Conditions promoting self-directed learning at the workplace. *Human Resource Development International*, 3(2), 241–251. <https://doi.org/10.1080/136788600402708>
- Svanström, M., Lozano-García, F. J., & Rowe, D. (2008). Learning outcomes for sustainable development in higher education. *International Journal of Sustainability in Higher Education*, 9(3), 339–351. <https://doi.org/10.1108/14676370810885925>
- Taylor, K. (1992). Action and knowledge: breaking the monopoly with participatory action research. *Community Development Journal*, 27(3), 326–329. <https://doi.org/10.1093/oxfordjournals.cdj.a038621>
- Turner, N., Ignace, M., & Ignace, R. (2000). Traditional ecological knowledge and wisdom of aboriginal peoples in British Columbia. *Ecological Society of America*, 10(5), 1275–1287. [https://doi.org/10.1890/1051-0761\(2000\)010\[1275:TEKAWO\]2.0.CO;2](https://doi.org/10.1890/1051-0761(2000)010[1275:TEKAWO]2.0.CO;2)
- UNESCO. (n.d.). Education for Sustainable Development. Retrieved October 24, 2016, from <http://en.unesco.org/themes/education-sustainable-development>
- Vogt, J. C., Bellina, L., & John, B. (2016). Virtuelle Mobilität und Kompetenzerwerb. In C. H. Karin Beck, Thorsten Bothe, Thomas Glaser & A. S. Julia Schütz (Eds.), *Bildung und Hochschule: Impulse für Studium und Lehre am Beispiel des Leuphana College* (pp. 171–202). Münster: Waxmann.
- Weinert, F. E. (2001). Concept of Competence: A Conceptual Clarification. In D. S. Rychen & L. H. Salganik (Eds.), *Defining and selecting key competencies* (pp. 45–66). Seattle: Hogrefe & Huber.
- Wesselink, R., & Wals, A. E. J. (2011). Developing competence profiles for educators in environmental education organisations in the Netherlands. *Environmental Education Research*, 17(932789702), 69–90. <https://doi.org/10.1080/13504621003637037>
- Wiek, A., & Kay, B. (2015). Learning while transforming: solution-oriented learning for urban sustainability in Phoenix, Arizona. *Current Opinion in Environmental Sustainability*, 16, 29–36. <https://doi.org/10.1016/j.cosust.2015.07.001>

- Wiek, A., Withycombe, L., & Redman, C. L. (2011). Key competencies in sustainability: A reference framework for academic program development. *Sustainability Science*, 6(2), 203–218. <https://doi.org/10.1007/s11625-011-0132-6>
- Wiek, A., Xiong, A., Brundiers, K., & Leeuw, S. Van Der. (2014). Integrating problem- and project-based learning into sustainability programs A case study on the School of Sustainability. *International Journal of Sustainability in Higher Education*, 15(4), 431–449. <https://doi.org/10.1108/IJSHE-02-2013-0013>
- Willard, M., Wiedmeyer, C., Flint, R. W., Weedon, J. S., Woodward, R., Feldman, I., & Edwards, M. (2010). The Sustainability Professional: 2010 Competency Survey Report. *Environmental Quality Management*, 20, 49. <https://doi.org/10.1002/tqem>
- Zull, J. (2004). The Art of Changing the Brain. *Educational Leadership*, 62(1), 1–6.

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In the 21st century, higher education faces a number of substantial challenges: We need to prepare students for the complexities of a highly interconnected and interdependent world so that they can act as informed and responsible citizens within a global society—as so-called change agents. Transnational collaboration projects offer unique opportunities for the education of these change agents in our globalized societies. They prepare students to work towards social change across cultural and geographical boundaries and make it possible to move beyond the distinction between global and local. Merging global and local means bringing together local learning, engagement, and impact with global communication, collaboration, and knowledge production.

The mix of global and local—*glocal*—characterizes our approach to transnational collaboration and our teaching and learning model. We introduce a glocal curriculum that aims to foster such education in fields as diverse as higher education for sustainable development, e.g. global health, the humanities, philosophy, etc. The glocal curriculum is based on experiences and experiments from the “Global Classroom: Liberal Arts Education in the 21st Century”, a teaching and research project in collaboration between Leuphana University Lüneburg (Germany) and Arizona State University (USA). From 2012 to 2016, 72 students in two cohorts were involved for around three semesters each in this program and a team of researchers accompanied the respective processes.

In this handbook we present resources and reflections including teaching and learning formats, activities, and digitally enhanced environments that we developed to support the education of change agents who are willing to critically and creatively contribute to sustainability transformations. The book covers three different stages, from (i) envisioning the glocal curriculum and its design to (ii) implementing and evaluating the glocal curriculum and program, to (iii) designing the glocal teaching-learning environment. Using a workshop approach, the Handbook provides valuable guidance for strategic university development, curriculum and program developers, quality managers, and teachers and instructors who are interested in innovative approaches that allow the development of critical and transformative mindsets, knowledge, and skills in order to address the sustainability problems of the 21st century.

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