TEACHING SUSTAINABLE FINANCE

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by

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Preamble

This report is part of a larger research project on the Supply and Demand for Sustainable Finance in a collaboration between Stockholm School of Economics' Mistra Center for Sustainable Markets (Misum) and NYU Stern Center for Sustainable Business. Our goal is to conceptualize how current and future finance professionals may acquire and mobilize their knowledge and expertise to integrate Environmental, Social and Governance (ESG) issues into their investment decisions.

- Supply: From Stockholm School of Economics, Misum, Executive Director, Professor Mette Morsing and Post-doctoral researcher Rachelle Belinga led the "supply side" of this research. They collected empirical data on how, and to what extent, higher education institutions bring together sustainability and finance into education.
- Demand: From NYU Stern Center for Sustainable Business, Research Associate Professor, Tracy Van Holt and Post-doctoral scholar Tamar Gross led the "demand side" of this research project. They collected empirical data on the knowledge, expertise, and practices that finance professionals both build on and lack to integrate ESG issues.

This report presents the overall results of the supply of sustainable finance education: how higher education engages in training future sustainable finance professionals, by providing them with ESG frameworks, tools and mindsets.

Mette Morsing and Tracy Van Holt
Project leads

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[1] We sent an earlier version of this report to all participants and named participants who provided authorization to be publically acknowledged. Quotes drawn from the interviews were verified with the corresponding participant and remain anonymous.

Executive Summary

- Financial professionals are not trained to integrate ESG in their work. They predominantly learn 'on the job' how to integrate ESG.
- To support the further development of sustainable finance markets, universities need to further integrate core sustainability issues in finance education.
- We carried out 52 interviews with leading scholars and lecturers in sustainable finance education to capture *how* sustainable finance is currently being taught.
- Sustainable finance teachers[2] have very diverse profiles and backgrounds. Many are not trained in finance but in other social sciences and even in environmental science. Nonetheless, they share the common belief that finance should contribute to solving sustainability issues.
- Integration strategies range from electives to core courses and master's degree specialization. While core courses are necessary to expose all students to sustainability issues in finance, in-depth elective or master courses are valuable to create expertise.
- In sustainable finance lectures, students may be introduced to main issues and strategies in sustainable finance, or develop technical skills and holistic reasoning.
- Teaching resources rely heavily on practitioner outputs, but case studies and textbooks are currently being developed and shared among teachers and academic groups.
- The lack of individual career incentives (such as research outcomes) and resources hinders the mobilization of teachers for sustainable finance.
- Participation in sustainable finance academic groups facilitates the integration of sustainable finance education and enhances teaching practices.

Recommendations

1. **Mobilizing and recruiting teachers**
    - 1.1. Higher education institutions (and other organizations) should provide dedicated funding towards sustainable finance research and education to encourage researchers to engage with this field.
    - 1.2. Editors in finance journals should foster and call for further sustainable finance publications.
    - 1.3. Higher education institutions should consider selecting candidates with expertise in sustainable finance when recruiting finance faculty, affiliated researchers or PhD students.
    - 1.4. When looking specifically for sustainable finance teachers, higher education institutions should consider broadening their scope and identifying hybrid talents within and outside academic finance.

[2] In this report, we group the various appellations for higher education professors, instructors and lecturers under the term "teacher".

2. Designing courses
    2.1. For a comprehensive integration of sustainability finance in the curriculum, higher education institutions should consider combining different strategies ranging from electives to core courses. For this purpose, our 'Integration strategy map' (Table 1) may be of assistance.
    2.2. For comprehensive training and skillsets in sustainable finance, teachers should consider combining different lecture types in their courses from survey lectures to advanced sustainability metrics lectures. For this purpose, our 'Learning goals and challenges table' (Table 2) may be of assistance.

3. Teaching resources
    3.1. Finance faculty with an interest in bringing sustainable development into the classroom can familiarize themselves with sustainable finance by following the work of academic groups such as: the Global Alliance for Sustainable Finance and Investment (GRASFI), the PRI Academic Network (PRI AN), the Impact and Sustainable Finance Faculty Consortium (ISFFC), the Canadian Sustainable Finance Network (CSFN) and the Post-crisis finance network (Pocfin).
    3.2. Sustainable finance academic and practitioner groups should further coordinate to create, standardize and share collective knowledge and resources in sustainable finance. For instance, they should advocate the translation of such knowledge in finance's most commonly used textbooks.
    3.3. Teachers may refer to *Principles of Sustainable Finance* (2018). The authors also freely propose teaching presentations and case studies alongside the book on their online platform. Teachers may also purchase case studies on Harvard Business Publishing's website. Additional resources and ongoing discussions of teaching practices can be found on the Impact and Sustainable Finance Faculty Consortium (ISFFC)'s online member platform and at their annual convening.

4. Planning for future demand
    4.1. Given the current demand and increasing offerings for sustainable finance courses, higher education institutions not prioritizing such courses should examine bridging this gap in their curricula.
    4.2. Higher education institutions and practitioners should consider preparing for increased specialization in sustainable finance. They could differentiate between skillsets, and further specialize in financial technique, sustainability metrics, financial instruments or holistic approaches to sustainability in finance.
    4.3. To cope with pressing sustainability challenges, sustainable finance academic groups and teachers should consider focusing on territory-specific sustainability issues and determining local needs for sustainable finance research and education.

Introduction

Since the launch of the UN Principles for Responsible Investment (PRI) in 2006, the integration of sustainability within finance has gained momentum. Many conventional asset managers now bring Environmental, Social and Governance (ESG) issues into their investment decisions (Van Duuren et al., 2016). In 2018, sustainable investing represented $30.7 trillions of assets under management around the world, an increase of 34% in only two years (GSI, 2019).

From practice to education

This shift in asset management and finance has been supported by the adoption of new rationales and tools (Eccles et al., 2017). The production of measures, standards as well as expertise have laid foundations for sustainable finance markets (Déjean et al., 2004; Slager et al., 2012). These markets will continue to grow and attract financial actors through the ongoing development of sustainable finance skills and knowledge, as well as the alignment of education with practice.

Research has emphasised the importance of business education to tackle sustainability issues and prevent a "near-term crisis" (Sidiropoulos, 2014; Starik et al., 2010: 377). On multiple occasions, business schools were held responsible for disseminating "bad" business and financial practices (Ghoshal, 2005; Giacalone & Wargo, 2009). Following the call for more responsible education, over 800 universities have globally signed to the UN Principles for Responsible Management Education (UN PRME). First studies on UN PRME signatories reported that business school have been increasingly embedding sustainability issues at different levels of their activity (Alcaraz et al., 2011; Godemann et al., 2011) but with insufficient integration throughout the whole curriculum and core courses (Godemann et al., 2011). To this regard, little is known on how sustainability is specifically brought into finance curricula. Prior research has suggested that finance programs lag behind other disciplines in this respect (Rasche et al., 2013) and that teaching resources for sustainable finance have been lacking (Starik et al., 2010).

Goals and research methods

To address this gap, we carried out a research project to **identify the best practices and challenges to teaching sustainability in finance**. With this objective, we interviewed 52 **leading** "sustainable finance" scholars and lecturers over 2019 and 2020 to not only learn from their experience but also draw on their hopes for education. We targeted scholars and lecturers who engage in academic communities dedicated to sustainable finance – namely the Global Alliance for Sustainable Finance and Investment (GRASFI), the PRI Academic Network (PRI AN), the Impact and Sustainable Finance Faculty Consortium (ISFFC), the Canadian Sustainable Finance Network (CSFN) and the Post-crisis finance network (Pocfin). These academic communities gather international professors, researchers, adjuncts, lecturers, and PhD students who actively participate to sustainable finance research and education, as well as collectively engage to improve their practices. This report originates then from in-depth analysis of each interviews (coded in the qualitative analysis software Nvivo), and was also informed by observations at the 2019 and 2020 GRASFI conference, the 2019 PRI AN conference and the 2020 ISFFC symposium.

We here share some of our empirical findings, with an emphasis on the determinants of sustainable finance education as well as the diversity of possible paths towards the integration of sustainability issues within finance. This report may be **useful for aspiring teachers[3] or confirmed teachers** who might wish to compare their own practices with others', for **higher education institutions** that wish to start or assess sustainable finance lectures and sustainable finance **academic or practitioner groups** that wish to better coordinate on educational needs. This report focuses then on the qualitative aspects of teaching sustainable finance - how sustainable finance is taught and why - and also presents some innovative and creative approaches in this field. The report is divided in 5 sections: teachers, integration strategy, learning goals, teaching resources, and barriers and enablers. Each section is illustrated through quotes, which have all been anonymized.

1. Teachers

In this first section, we give an overview of our sample to present who sustainable finance teachers are, why they teach it and how they define it. We find that profiles are very diverse, including some very experienced teachers. They are often driven by sustainability issues and personal ethics, as well as student and market demand. While sustainable finance is not a clear-cut concept for them, they generally agree that their field contributes to solving sustainability issues through finance.

Diversity of profiles

Our 52 interviewees represent 39 different universities and schools from 14 countries (on four continents). They work at top higher education institutions. 5 of them worked at Ivy League schools, 20 at business schools ranked in the Financial Times' 2020 Global MBA ranking and 23 at research universities in the top 100 of Shanghai's 2020 Academic Ranking of World Universities. Among our interviewees, 36 interviewees are confirmed researchers and 5 are on-going PhD students. 11 adjuncts, lecturers and professors of practice complete this sample. Among the 41 researchers, 17 are finance scholars. 6 other disciplines are represented: accounting, organizational and management studies (OMS), economics, law, geography and sociology.

[3] In this report, we group the various appellations for higher education professors, instructors and lecturers under the term "teacher".

The composition of our set of interviews illustrate the **diversity of sustainable finance teachers**. 35% of our interviewees have prior or ongoing practitioner experience in sustainable finance. 54% of scholars are trained in disciplines outside finance. These hybrid actors are also hosted in hybrid places, only 37% of our interviewees are affiliated with finance departments at business schools. Several work at research institutes, interdisciplinary units, schools of geography or environment, and even public administration schools.

Some experimented teachers

In contrast with what we could have expected, teaching sustainable finance is not such a new phenomenon. Many teachers, and especially adjuncts and professors of practice in the United States, have a **long experience of teaching sustainable finance**. One of our interviewees' first course dates back to 2004. This same interviewee now teaches 4 different courses in sustainable finance at his business school.

Incentives to teach

Sustainability issues are important drivers for most of our participants to teach sustainable finance. They often describe a feeling of urgency.

Illustrative quote 1

> *And looking at the future, I think if we keep on doing business as we have the past century then we, as a humankind, won't survive the next century. That's really what I believe. […] So we should educate students, but also adults working in this area, what I call the nonfinancial world. The social and environmental part of business is at least as important as the financial element.*

Most also emphasize that **student demand** is strong for sustainable finance courses. It not only motivates teachers but also pushes universities to rethink their curriculum. Several interviewees told us that their sustainable finance course was created or authorized by their universities to answer student demand.

In addition, **market demand** strengthens that call. For example, a tenured finance professor told us that despite his mainstream background he values sustainable finance education because of the evolution of societal expectations, the reorientation of jobs toward ESG investing as well as sustainability concerns.

Illustrative quote 2

> *Even if firms are not advertising specifically for jobs with ESG knowledge, or knowledge on sustainability considerations, there are a lot more jobs coming up that way. […] All the people who are working at mainstream jobs now are being told that they need to integrate ESG considerations into their work. And they are not trained for it. It's not a new job posting, but if you want to keep your job now, or progress up the food chain, then you better learn how to answer these. And sometimes it's coming from their superiors in the organization. Quite frankly, it's coming from the customers. They are going to talk to their investment advisor, or lender, what are you guys doing with respect to sustainability integration. And if you don't have the answer to that question, then they are probably going to go across the street, and ask the person in your*

position there, what is your organization doing. So, education to me is really important. The research is necessary to move the dollars, and the education is necessary because there's a heavy demand for it.

Defining sustainable finance

During our interviews, we left open our understanding of sustainable finance and actually asked for our interviewees' own definitions. We also asked them whether they use another terminology. While some speak of "responsible investing", "climate finance" or "impact investing", "sustainable finance" was most commonly used. However, many interviewees pointed out that defining sustainable finance is **difficult**. It can refer to very different practices, sometimes even enabling greenwashing.

Illustrative quote 3

> *People will call sustainable finance pretty much anything. It's a bit like green bonds, so people will say, 'Oh, we have a green bond.' But what are they promoting in the green bond? 'Well, we're promoting clean coal.' Is there such a thing as clean coal? So you will see that, 'Oh, we have a sustainable finance project.' Well, what is it? 'Well, we're using, we're buying this thing which has certain energy efficiency characteristics, and therefore it's sustainable finance.' So all they're doing is they're retrofitting what they would be doing with energy and they're not actually modifying what they're doing.*

The United Nations **Sustainable Development Goals** (SDGs) were then frequently mobilized to define sustainability issues and what should be on sustainable finance's agenda. They appeared as a relevant and helpful framework. Many of our interviewees give however greater focus to environmental targets than social ones.

Illustrative quote 4

> *To me sustainability is about the environment. I guess the SDGs are a good guideline. But then if you have the SDGs, it goes into social issues, like poverty and so on. […] I mean you could go for environmental finance. Climate, it's climate: Adaptation, mitigation. Environmental you could talk about biodiversity, a broader range of environmental issues. And we arrive to social issues. Sustainable finance, I guess, it has been linked a lot to the SDGs. And that's fair enough.*

In general, the participants agree that sustainable finance is **umbrella term** and that its goal is to achieve positive **impact** on sustainability issues. It then can be described as a spectrum between high return-low impact and low return-high impact.

Illustrative quote 5

> *It's a spectrum between philanthropy where you give money away with only the goal of creating impact, and investment of a traditional sort where you invest money hoping to get all of it back and then some, a rate of return without considering the consequences of that. And so between these two extremes, there's a variety of intermediary points where you could consider the impact you make if you were giving money away or the return that you might make if you were funding different projects. Or for that matter, looking at the other end of the spectrum, the impact that you might have when you make an investment.*

Teachers themselves have a broad understanding of sustainable finance. Yet, despite the diversity of their profiles, they all agree that finance has a role to play in solving sustainability issues and achieving the SDGs.

Recommendation:

Teachers from diverse and hybrid profiles have nurtured the development of sustainable finance education. When looking for sustainable finance teachers, higher education institutions should consider broadening their scope and look for talents within and outside academic finance.

2. Integration strategies

When evaluating the integration of sustainability within business curriculum, prior studies have looked at **where** sustainability issues were integrated (Godemann et al., 2011). The experiences of our interviewees show a great variety of integration strategy from electives to sustainable finance degrees.

Table 1: Integration strategy map

Integration strategy	Frequency in our sample	Advantages	Disadvantages
Elective	Very high	• Low creation costs • Potential in-depth exposure	Self-selection bias
Core finance course	Medium – high	• Existing courses • All finance students get exposure	Cursory exposure to sustainability
Core sustainability course	Medium – low	• Existing courses • All sustainability students get exposure	Cursory exposure to finance
Executive education	High	• Low creation costs • Potential in-depth exposure	Self-selection bias
Master's degree	Very low	• In-depth exposure • Interdisciplinarity	• Self-selection bias • High creation costs

Electives

Electives appear as the **most common strategy** for teaching sustainable finance. Their first advantage is that it is **less costly** for universities to offer new electives, as additions to their finance or social business programs, than it is to create a new core course and rethink the whole curriculum. For sustainable finance teachers, electives are often an initial "foot in the door".

Illustrative quote 6

Interviewee: "In 2010, I started teaching investing for environmental and social investment. And I was asked by the person running the social enterprise program to develop a course. Because the students wanted the

course. And there were lots of social enterprise courses but there was nothing out of the finance department."
Interviewer: "So you were not affiliated with the finance department then?"
Interviewee: "No, that's what was great about it. From the very beginning, I was hired by the finance department. So, I've always taught my class as a finance course, a finance elective."

Since then, this same interviewee was asked by his finance department to create a new course in sustainable finance.

Collecting sustainable finance electives also offers the **potential for in-depth exposure**. Brought together, sustainable finance electives can create an informal specialization in the curriculum.

Illustrative quote 7

"

We actually only have majors in finance, marketing, strategy. We only have those very core majors. What we have instead is what we call pathways, and they're basically à la carte menus of electives that students can take to create their own academic path.
So, our students who are interested in sustainable finance can take the Impact Investing and Sustainable Finance class. We've got Early Stage Impact Investing and a Global Initiatives course on impact investing. We've got my class called the Business of Social Change. We've got Decision Making for Sustainable Business. I could go on and on. We have 38 classes along our social impact pathway.

One interesting alternative to traditional electives are **experiential learning courses**. These highly selective courses are principally offered in the United States, and put students in the situation of working directly with practitioners. Drawing on their universities' contacts with sustainable finance and impact investing professionals, teachers help students navigate this world, apply and reflect on its practices. Teachers report positive feedback both from students and practitioners.

Electives, however, only target already interested students. There is a **self-selection bias**. Students who do not demonstrate prior interest in sustainable finance and do not pick corresponding electives may get their finance or business degree without ever being exposed to sustainability issues in finance. Some of our participants actually deplore teaching only electives, especially at graduate level when students are close to making their career choices.

Illustrative quote 8

"

So that's very different from the large courses I teach to undergrads because it's an elective course. [...] They're already convinced. They're a group of students who are interested in sustainability. So for me, it's a fun class to give but that's not the one I would invest most in, because that's not where I'm going to make a difference. It's already too late. They're second-year master students and they're already convinced. For me, they don't even need that class. What I mean is, I feel like I can have more impact in terms of eye-opening and change of paradigm when I teach the undergrads.

Most participants wish that sustainability would be integrated in Finance 101 classes, and throughout all core courses in finance.

Core courses in finance

Getting sustainability into the core finance curriculum is already on its way. Many finance professors or professors affiliated with finance departments have transformed their teaching offerings. Some created a sustainable finance course and were able to include it as a mandatory class, for instance at graduate level. Most integrate sustainability within their **existing finance courses**. For instance, they teach portfolio construction, discounted cash flows or asset pricing, and draw on examples or case studies taken from the sustainable finance world. One interviewee describes this integration strategy as a **Trojan horse**.

Illustrative quote 9

> *I am in charge of a corporate governance course for a Master in Finance. I use this course as a kind of Trojan Horse for getting accounting and finance students to connect classical corporate governance content with the rising shareholder focus on societal and environmental challenges and the whole SRI landscape.*

These core finance courses **expose every finance student** to sustainability knowledge. It broadens students' understanding of finance's objective. In contrast, it is harder for teachers to convey sustainability concerns if students already operate under the shareholder value maximization norm.

Illustrative quote 10

> *Typically, the first thing you learn in finance 101 is what is the goal of the financial manager. And the goal has always been, and still is in most textbooks, shareholder value maximization. From there, students are taught that every financial decision, the way you decide for example to go with this project or this project, why we use NPV [Net Present Value] it's because it's a measure of value that is created for shareholders. The ultimate goal is to maximize share price. So students are trained to think that way when they are first introduced to finance, and then you teach them sustainability, and you say "oh by the way, there's a thing called triple bottom line, you should not think like that". It's hard to undo what they learned before. We need to start from the beginning. For example, even though I teach an intro finance course, when we have our initial class and we discuss the goal of financial manager, we actually discuss that it should not be shareholder maximization. It's one aspect. There are advantages to that, but there are other stakeholders involved. So we discuss that, we look at more recent articles talking about the limits of shareholder value maximization and introduce social, environmental and governance considerations. I think it's better that way then just learn the basics without any sustainability lens and then have to rethink all your knowledge.*

Integrating sustainability issues in core finance classes, early in the curriculum, is thus more efficient to get students to consider sustainability as part of their finance education. Yet, the exposure to sustainability remains **cursory**. Many of our interviewees emphasized that they wish sustainable finance would be fully merged with mainstream finance, and that all students get sustainability expertise. These teachers consider that, in the future, practicing finance shall be practicing sustainable finance.

Core courses in sustainability

Sustainable finance is not only taught in finance programs but also in business or multidisciplinary programs focusing on sustainability. These courses can be designed for environmental, social business, or corporate social responsibility students that need to learn the **language of finance**. For instance, a professor teaching in an environmental program explains how he dedicates parts of his sustainability classes to finance.

Illustrative quote 11

There are a number of courses I teach where I do several classes, but not a whole semester on sustainable finance. So I teach an undergraduate course called sustainability and a couple of lectures relate to sustainable finance out of a whole semester. I teach a course on climate change and one lecture is on sustainable finance as a way to talk about how you get the money to flow to a clean energy infrastructure. So I think it's important to recognize that to teach sustainable finance, one has to have an array of platforms, not simply semester long courses, but one could imagine having it be a lecture or two in many more classes than it is today.

The goal of such classes is to equip **all sustainability-oriented students** with sufficient financial tools to later exchange with finance professional on equal grounds or to support their own career in sustainable finance. These classes however offer as well **cursory** knowledge in sustainable finance, and some teachers suggest complementary electives to strengthen students' finance skills. Another interviewee for instance compares his corporate sustainability "survey course" to his environmental finance elective. The former is targeted to a large audience of business students whereas the latter is more advanced and requires prior knowledge in sustainable finance- -often the corporate sustainability course.

Executive education and certificates in sustainable finance

Another **common integration strategy** is the creation of dedicated executive education and certificates in sustainable finance. These courses are targeting both sustainability professional and finance professional. While these courses are also subject to a **self-selection bias**, like electives, they are attractive and **less costly** to add to an institution's course offering than modifying core curriculum. Several interviews pointed to the interest for sustainable finance among Non-governmental organizations (NGOs) and governmental officials. Finance professionals also enroll in these trainings to adjust their skillsets to new expectations regarding sustainability.

Illustrative quote 12

The course that I've just finished teaching is the post-graduate certificate in sustainable finance, it's the first time we've run it. […] It is targeted at professionals with experience in banks, that's the target student body, and that's largely who signed up to do the course. What we want to do with our course, it's easier to describe the outcomes for them than it is to describe the course, what we would like them to be able to do, in their jobs, is to have a broader base of knowledge of what's out there in sustainable finance, but give them skills that enable them to do their job better.

While for most of executive education is generally an introduction to sustainable finance, it can be very advanced training. Some aim to train future experts in the field.

Illustrative quote 13

On the professional side, [education] is really expertise, people that take these courses can actually become consultants, or they can be the specialist at their organizations, or at least the main champion at their organization on sustainability.

Master's degree and specializations

Lastly, some business schools with **a lot of in-house expertise** have started to create master's degrees and specializations in sustainable finance. They design a one to two-years curriculum which encompass **in-depth analysis** of sustainable finance, reaching at times outside of finance or diving into financial analysis and modelling.

Two European experiences in particular caught our attention. Both have run their masters for several years, with positive feedback and increasing student enrollment demands. They both draw on strong links with industry. The first one was born in 2013 and comprises two years of courses, including a master thesis and internship. The curriculum emphasizes a **double expertise in sustainability and finance**.

Illustrative quote 14

> *The way it's structured is we have a broad curriculum, but we tell students, okay, this program is for the two types of students. Ones who are really interested about finance, but see that sustainability is such a broad, or have such an important role in finance. You need to know about it. In your valuation, how can you take sustainability into account, for your corporate finance decisions but also for your asset pricing decision.*
> *We serve that type of students, but we also serve the students who come from the opposite and says, well I have a sustainability background, but now I want to know a bit about finance so that I can be more effective, because eventually you need money. You can want to improve the world, but if you don't get the money... We serve both those type of students, we do that by having courses that are more finance oriented, like financial research methods, where you really learn the financial techniques, to my course where you develop a sustainable investment product in class, together with the financial industry.*

The other one is a one-year program, born in 2015. It offers **critical and interdisciplinary courses**, which go from climate risk modeling to legal issues and geopolitics.

Illustrative quote 15

> *Finance is a tool, and sustainability the target. We want our students to have a broad, macro perspective. That's why we work a lot on macro contents. At first, we don't teach finance but geopolitics, sociology, macro-economics, debt, currency. What's a currency? What's its role? An anthropology of finance. And then, we give them very technical tools, tools that they will use later in their firm. Financial tools, extra-financial ones, both. They will then have the ability to know why they are using these tools and how to use them.*

Integration strategies are therefore very varied and largely dependent on each university's human and material resources. Research had insisted on the importance of integrating sustainability in core business courses (Godemann et al., 2011). While integration of sustainable finance in core courses appears as crucial throughout our interviews, many also value the ability to offer in-depth courses and create expertise among students through electives, specializations or executive education.

Recommendations:

- Given the current demand and increasing offerings for sustainable finance courses, higher education institutions not prioritizing such courses should examine bridging this gap in their curricula.

- Integration strategies vary, and each has its pros and cons. For a comprehensive integration of sustainability finance in the curriculum, higher education institutions should consider combining different categories of course from electives to core courses. For this purpose, our Integration strategy map (Table 1) may be of assistance.

3. Learning goals

These different integration strategies are closely linked to the pedagogy and its related learning goals. We have seen that core courses in sustainability introduce finance in the context of sustainability whereas core courses in finance introduce sustainability in the context of finance. In this section, we now move to look at learning objectives and how sustainable finance is described, characterized and taught. We observed three types of lectures with different learning goals and corresponding challenges: survey lectures, technical lectures, and holistic lectures. We here distinguish courses from lectures. Some courses may only have a few lectures or sections on sustainable finance, and others may combine different lecture types.

Table 2: Learning goals and challenges per lecture type

Lecture type	Description	Learning goals	Learning challenges
Survey	Introduce sustainable finance definitions, issues and strategies	Raise awareness	Spark future curiosity
Technical	*Financial techniques* Adapt financial analysis and calculus to sustainability	Learn the mechanics of materiality in finance	Cope with complexity and uncertainty
	Sustainability metrics Introduce and apply measurement techniques for sustainability	Learn the mechanics of measuring sustainability	
	Financial instruments Match sustainability issues with financial tools (e.g. asset classes)	Learn the mechanics of designing financial instruments and financial deals to solve sustainability issues	
Holistic	Interdisciplinary approach to sustainable finance	• Learn different skillsets • Stir critical thinking	Adapt to different problematizations and framings

Survey lectures

Many courses that integrate sustainability issues in finance have **introductory** or "survey" lectures on sustainable finance. The first elective that business schools offer on sustainable finance tend to be such survey courses. Targeting beginners, these lectures cover the phenomenon, the history, the main strategies and the main issues right now in sustainable finance. In core courses, lectures that introduce sustainable finance provide some first definitions and examples. They intend for students to get first exposure and grasp the implications for investment of sustainability.

Illustrative quote 16

I don't see as an impediment to education, quite frankly because we are literally at square one in education. You don't have to know a whole lot to go into a classroom to talk about sustainable finance, you know more than most people in the classroom. So that's a good thing in the sense, you are adding value. Even, you maybe think that you need to do all these complicated things but just talking about some things that have become table stakes to yourself after a while, to this group is new. Even I'll just going to a group with all sorts of things, and I'll do a survey 'how many people knew there was a [national] expert panel on sustainable finance ?', and less than half of them knew it, so just think.

Sustainable finance teachers thus explain that these lectures' first goal is to raise **awareness** among students. They hope that it will spark their **curiosity** and that, once exposed, interested students may further inquire on sustainable finance. As for the less interested ones, they might encounter it in their future position and then remember the world and vocabulary surrounding sustainable finance. Teachers however emphasize that these introductory classes are insufficient as sustainable finance education is developing and that being aware of their existence is not enough to be "trained" in sustainability issues in finance.

Technical lectures

Sustainable finance may also be taught through technical lectures. Many courses have developed specialized lectures on one or more technical aspects of sustainable finance.

1. One first aspect is **to adapt financial techniques**, or calculations, to sustainability. Many courses propose lectures which push student to modify for instance discount rates in discounted cash flows calculations due to ESG concerns. Others propose climate risk modelling classes to adjust asset pricing to the assets' exposure to climate risk. These classes require **strong financial skills.** Some sustainable finance teachers insist that sustainable finance skills consist in finance skills plus an increment. These teachers thus consider that students should master financial techniques before trying to adapt them. They emphasize **materiality**, i.e. how sustainability issues affect finance.

2. Materiality issues foster a second type of technical classes, which delve into **sustainability metrics**. In these classes, teachers move beyond ESG ratings and expose students to measurement issues in sustainability as well as companies' corporate social responsibility or corporate sustainability reporting. In turn, mastering these metrics helps students weigh value and risk differently.

Illustrative quote 17

> *We start with the metrics that are easy and known, and then we explore the metrics that are difficult or where the standards aren't set. As an example, we start with greenhouse gas emissions scope one, two, and three which is well-formulated in the green gas protocol. But from there we want to explore what would a low-carbon portfolio of companies look like? How do we compare company A's scope three emissions to company B's scope three emissions? How do we compare ExxonMobil against Ford for their carbon emissions? So we look at the challenges of comparability, scope, and methodology that underlie those metrics.*

Such technical classes emphasize the **complexity** of measuring sustainability and teach students how to deal with such complexity. When asked about sustainable finance skills, another interviewee told us that students have to recognize a few things, among which that "you cannot dumb it down, you cannot narrow down sustainable investing to a single number".

3. Focusing on **financial instruments** constitute a third type of technical classes. In these classes, students learn how to match sustainability issues with dedicated financial instruments.

Illustrative quote 18

> *There's three modules. The first module is financial tools to address environmental problems. The second tool is financial tools to address essentially poverty in developing countries. And the third tool is to address social issues in the United States. Each week is a different systemic problem and a different financial tool. For example, biodiversity loss and we look at debt for nature swaps. It's a financial tool. Climate change and we look at carbon markets. Each week, different tool.*

Some sustainable finance teachers even give assignments that require students to design their own financial product or innovation which can solve a sustainability issue of their choice. Students then have to convince their classmates or guest practitioners that their innovation can drive impact.

One challenge for technical classes in general is that – be it financial techniques, sustainability metrics or financial instruments – there are **no right answers**. The technical integration of sustainability issues in finance has not yet been standardized and a lot is still left to one's judgement and to students' own judgement.

Illustrative quote 19

> *It's not a space that have simple answers. If you're teaching financial accounting, it's pretty obvious, what it is, why you're doing it, what everyone thinks it is, what are the right answers. Whereas here, for instance the company we're going to look at in one of the sessions, is a big company with a huge sustainability report, it report tons of information, but it's not very clear what you're supposed to do. And those create some questions.*

Teachers even share that it is **difficult to grade** students in such classes. There is no one right adjustment to a discount rate, nor perfect comparisons possible between companies that disclose sustainability metrics differently. As ESG data, metrics and techniques improve, we could expect these challenges to decrease over time.

Holistic classes

Opposite to technical classes, some classes take a more macro perspective. Teachers here focus on holistic pedagogy. Drawing on environmental sciences as much as social sciences, these classes push students to broaden their understanding and strengthen their **interdisciplinary knowledge and skills**.

Illustrative quote 20

> *They have to have the scientific basis. For finance to really help out climate change, they have to really understand science underneath climate change. People cannot shy away from a holistic education at this point. I think it has to be multidisciplinary, I think they have to understand engineering to some extent. How can you finance a project if you don't understand the science and engineering under it, to actually help and do something better for the environment, or something socially better. How can you finance social housing, affordable housing if you don't understand the engineering that has to go into that, the architecture, and the design of that region, of that part of a city, if you are going to build, finance; You have to take that responsibility to understand.*

Such classes focus on other disciplines' approaches and conceptualization of sustainability issues. These classes thus initiate students to **different skillsets**, which require students to **adapt to other disciplines' problematizations and framings**. Like technical classes, holistic classes do not promote "right answers" in sustainable finance. However, they do not look for better measures but for other types of reasoning. Some teachers therefore try to interest students in qualitative approaches and soft skills.

Illustrative quote 21

> *What [the finance department] started realizing is that the students were interested in the topic. I didn't have the best evaluations because I was the funniest person. I got good evaluations because students were interested in the topic. The way I designed the class is actually as a social study of finance. I really teach the class like deconstructing the financial market. It's like a social anthropology class.*

These teachers raise for instance ethical and epistemological issues in finance. Following critical studies in finance (e.g. Fourcade & Khurana, 2013; MacKenzie, 2008), they emphasize that finance is a social system connected to other social systems and embedded within the natural ones. Lectures **deconstruct** financial markets as well as financial techniques, to understand their assumptions and question their relevance. These lectures aim to stir **critical thinking**.

There is then no homogeneity between sustainable finance courses. They may vary between different types of lectures that will each emphasize specific learning goals. Learning goals range from simple awareness to interdisciplinarity approaches and the mechanics of measuring sustainability. Beyond learning goals, teachers at times also opt for diverging epistemological perspective on sustainable finance- one which adopts finance's positivistic epistemology and one which embraces critical studies.

Recommendations:

- Akin to integration strategies, learning goals are diverse, and lead to equally diverse types of lectures. For a comprehensive training and skillsets in sustainable finance, teachers should consider combining different lecture types in their courses from survey lectures to advanced sustainability metrics lectures. For this purpose, our Learning goals and challenges table (Table 2) may be of assistance.
- As sustainable finance markets grow, higher education institutions but also practitioners should consider preparing for increased specialization in sustainable finance. They could differentiate between skillsets, and further specialize in financial techniques or sustainability metrics or financial instruments or holistic approaches to sustainability in finance.

4. Teaching resources

Since scholars had already called attention to the need for significant teaching resources for sustainability in business education (Starik et al., 2010), we also asked our interviewees for their use of teaching materials.

Many of our participants make an extensive use of **practitioner and policy reports** on sustainable finance. They emphasize the richness of these numerous reports. For instance, resources from the UN PRI or the Task Force on Climate Related Disclosures (TCFD), as well as the Sustainability Accounting Standards Board (SASB) framework for materiality, are frequently used by our participants. Some also use other practitioner outputs such as **databases** in sustainable finance, from Sustainalytics, MSCI or even Bloomberg and Facset.

Some courses directly look into corporations' sustainability or Corporate Social Responsibility (CSR) reports to either evaluate the quality of the report and/or the quality of the stock. Based on this reporting, students engage in **simulations** such as portfolio competitions or **stock pitches**. These assignments require students to carry out very applied sustainable finance analyses.

Our interviewees also report inviting asset managers or rating agencies as guest speakers, with very positive feedback from students. While some might have considered sustainable finance as a small and neglected practice, guest speakers both legitimize the practice and give students a sense of its momentum among current financial practices.

Besides resources from the practice world, many participants (would) appreciate good **case studies** and a good **textbook**. To this regard, Harvard Business Publishing has made an important effort to provide now more than 20 sustainable finance case studies. We nonetheless found that many of our participants create their **own content** and write their own case studies. They often use local case studies so that students can relate better to sustainability issues on their own territory. As for textbooks, many interviewees use *Principles for sustainable finance* (2018) by Dirk Schoenmaker and Willem Schramade, and told us it was a valuable resource to start teaching a sustainable finance class and give students a reference. Some interviewees however deplore the lack of integration of sustainability issues in common finance textbooks.

Illustrative quote 22

> *The ideal resource is a new manual. Finance 101 that is co-created by all finance professors. So people from the financial education world, with backgrounds in finance rather than social sciences, philosophy, or environmental science like many of us have. Although they're great, but in terms of credibility… This would be online for everyone, not just students. Students as well, of course. And finance professors who would like to do something different but have no idea how to deal with it. And, professionals as well who never got a chance to be trained in sustainable finance and who can do it if they want. It would be very local, with lots of cases and data for different local areas, that makes sense to people who use it.*

While they insist that they are not always accessible or practical enough, many interviewees also include **academic readings** to their syllabus. Some researchers share with students their own research and engage students in current topics and debates in sustainable finance research.

Recommendations:

- Sustainable finance academic and practitioner groups should further coordinate to create, standardize and share collective knowledge and resources in sustainable finance. For instance, they should advocate the translation of such knowledge in finance's most commonly used textbooks.
- Teachers may refer to *Principles of Sustainable Finance* (2018). The authors also freely propose teaching presentations and case studies alongside the book on their online platform. Teachers may also purchase case studies on Harvard Business Publishing's website. Additional resources and ongoing discussions of teaching practices can be found on the Impact and Sustainable Finance Faculty Consortium (ISFFC)'s online member platform and at their annual convening.

5. Barriers and enablers

Drawing on our interviewees' experience, we also identified some barriers and enablers to teaching sustainable finance. At the individual level, **incentives** play an important role. For instance, research is a powerful incentive to get scholars to include sustainability in finance teaching.

Illustrative quote 23

> *I talked to one of the deans, how can we get to change the curriculum. And then he said we cannot force professors because they do their own thing. So start with research, when you do the research, then you get excited about it then you're willing to implement it in your teaching. So research is a very powerful way to get academics into the topic and then to finally to get it into the teaching.*

However, several interviewees have suggested that sustainable finance might not be a good strategy for early scholars on a tenure track clock. Publication outcomes are often a barrier to sustainable finance research. Similarly, creating content or finding teaching resources is time-consuming, especially for researchers with high pressure publication targets

In the classroom, some of our participants pointed to the role of mixing students from different disciplines. A **multidisciplinary audience** contribute to a better-informed and broader conversation on sustainable finance.

Illustrative quote 24

> *We have[finance] students, we have also people who have sustainability background. Even this year we had people with a psychology background, we have people from liberal arts. It's quite broad, when we formed subgroups, then we also make sure that different expertise is mixed into these groups, so that you have a finance person working together with a sustainability person, emerging markets person. Because then they learn from each other and the finance people are forced to explain the finance ideas, but they learn again from the emerging market person, how it really works in there.*

The confrontation of these different groups of students strengthen the interdisciplinarity of the class itself.

Institutional support is also an important lever for sustainable finance education. While some early sustainable finance teachers were dismissed by their university, schools are putting more emphasis on sustainability and answer students' growing demand for sustainable finance education. Many of interviewees shared with us their own success stories, where they first got rejected and are now getting the full support and attention of their university.

Illustrative quote 25

> *Interviewee: The first year the curriculum committee rejected it and they laughed at me. They said: 'what does sustainable investing even mean?' That's not a market. […] The second year, there was a bit more awareness and even if they didn't really understand what I was talking about, but they decided to give it a chance and went ahead. The course has been oversubscribed every year since then.*
> *Interviewer: Have they reconsidered since their position?*
> *Interviewee: Dramatically so. In the sense, the university kind of caught up across the board on the notion of sustainability, now it's quite a strategic imperative at the university. Sustainable investing itself has been*

recognized widely across the university as something that's one of the strategic aspects of what they have to look at. The business school has reinvented its strategy and one of the core elements is sustainability. […] Two weeks ago, we launched this new program in collaboration with a large insurance company, it's called sustainable investing practicum. I have selected a number of students to manage a fund, where there's a sustainability mandate, in close collaboration with [the insurance company]. This is the first time that we're doing this, and we wished to launch [an event]. So we did it virtually, and just to give you a sense of the commitment, the diversity, the president of the university showed up to the zoom virtual cocktail, the provost showed up, the CFO showed up, the dean of the business school showed, the chair of the finance department. So all the top brass at the university were there for the launch.

Interviewees not only call attention to material resources but also to **human resources**: teaching assistants and PhD students among others. Many of them find themselves isolated in their universities and would not be able to extend the offering sustainable finance courses due to the lack of colleagues and help.

Lastly, at field level, **academic groups** like the ISFCC or GRASFI, give teachers the opportunity to meet and share their best practices. These groups convene on a regular basis and exchange teaching resources such as syllabi. National academic groups like the CSFN or Pocfin also emphasize local issues in sustainable finance research and education, which may frame students' future careers. In the following example, future investments and investors in the transition to a carbon-neutral economy in Alberta (Canada) will not only shape the future of the region but also their ability to further invest and work in this region.

Illustrative quote 26

“

We have just started a seminar series for CSFN. I think the reason I wanted to get in was it's such an important topic. Maybe it sounds a little bit dramatic, but it's a life and death issue for this province. If we don't get it right, this province won't have a bright economic future. So, it's one of those topics that is really important.
Interviewer: You mean because of the oil and gas industry?
Interviewee: Because of oilsands. If you don't figure out a way to reduce greenhouse emissions, it's going to be a game-over for this province.
Interviewer: That's specific to this province only?
Interviewee: Oilsands are mainly in Alberta, but there's also Saskatchewan. But it's especially important for Alberta. We have to figure out how we finance the transition for oil and gas, if oil and gas have any future in a carbon neutral world.

The CSFN thus gives a platform for teachers concerned with such issues, and to share research and knowledge about it.

These different enablers – individual incentives; classroom support; institutional support and field support- all constitute levers to develop sustainable finance teaching offering. Although teachers do not have full control of each and every one of these levers, universities that wish to empower their future or current sustainable finance teachers might consider how to remove corresponding barriers.

Recommendations:

- Higher education institutions (and other organizations) should consider providing additional funding to sustainable finance research and education to encourage researchers to engage with this field.
- Editors in finance journals should foster and call for further sustainable finance publications.
- Higher education institutions should consider selecting for sustainable finance expertise when recruiting finance faculty, affiliated researchers or PhD students.
- To cope with urging sustainability challenges, sustainable finance academic groups and teachers should consider focusing on territory-specific sustainability issues and determining local needs for sustainable finance research and education.

Conclusion

Sharing insights from leading sustainable finance teachers can further advance the integration of sustainability issues in finance education. Stemming from this assumption, this report relies on a qualitative study of current teaching practices and presents empirical findings on teachers' profiles, integration strategies, learning goals, teaching resources, as well as barriers and enablers. For each section, we provide on this basis a few recommendations, which that may be found in the executive summary. Since we have begun this work, we have been surprised to see how diverse and advanced sustainable finance education already is. We hope that future teachers find in this report inspiration for designing their lectures, finding resources and engaging with their institutions and dedicated academic groups. As for confirmed teachers, we hope that they can compare their own practices with others', and might find additional ideas or resources to complement their courses. This report may also help higher education institutions design their own path towards the integration of sustainable finance education, or review their current practices. Finally, academic and practitioner groups may find in this report means to support sustainable finance education and encouragement for continued coordination regarding educational needs.

In this report, we focused on the determinants of sustainable finance education and illustrated the diversity of integration strategies, learning goals and lectures. Further research could move to systematically compare between the learning outcomes, student satisfaction and practitioner satisfaction of different sustainable finance education paths.

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