**Incorporating SDGs in an Introductory Macroeconomics Course**

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**ABSTRACT**

*The Principles for Responsible Management Education (PRME) promote the Sustainable Development Goals (SDGs). Schools participating in the program can naturally provide students an introductory overview of the SDGs through the introductory principles of macroeconomics course most students take during his or her freshman or sophomore year. SDGs can be linked to both current and historical events in the United States and globally. It is important to view them mainly through economic perspectives but also through the lens of firms and governments to see the big picture. This paper provides detailed examples and pedagogical notes elaborating on designing this into the curriculum. We also discuss suggestions implementing the SDGs into other business classes and future research regarding SDG assurance of learning.*

**INTRODUCTION**

In order for our world to continue in the face of its many challenges, education is a useful tool we in academe can use alongside our institutions to promote and encourage change. One such method includes business schools collaborating with the United Nations to become involved with the program Principles for Responsible Management Education (PRME). Founded in 2007, this voluntary initiative supports sustainability in business schools by equipping “students with the understanding and ability to deliver change tomorrow (www.unrpme.org).” This particular organization carries great capital resources and has the capability to influence, support, connect, and promote via its large access to various channels (Storey et al., 2017). Through the UN Global Compact, this particular alliance promotes the Sustainable Development Goals (SDGs), listed for reference in Table 1.

These goals alongside education provide the opportunity for teachers to give students the tools they need to give the next generation a chance to make right what past generations have not. Even though not all individuals will choose the sustainable path or careers focusing on opportunities to change the current institutions, awareness, and knowledge of the current situation and what will happen if nothing changes is a better proximate good than the alternative of doing nothing.

One opportunity for such education in the business school is in economics, specifically introductory macroeconomics. This course is taught not just hopeful business and economics majors but to many other majors in university requiring the course, including other social sciences, engineering, or others wishing to receive a well-rounded and/or liberal arts education in how to allocate resources in a world of scarcity. Thus, one can plant multiple seeds of concern for sustainability is not just business students but also other fields in the hopes of educating a diverse public for achieving the common good, which is an old-school view of the purpose of the university.

In order to demonstrate how this can be achieved, the remainder of the paper is organized as follows. First, we discuss what others are doing in this related field of economics and discuss a Christian critique of the SDGs. This will lead to why this paper at this time and provide the layout of the class in question with suggestions for materials and techniques used to demonstrate SDGs and how this was done in an introductory macroeconomics course. Next, we move to the assurance of learning and discuss future research opportunities. We conclude with a vision of what this may look like comprehensively for a business or economics program.

**LITERATURE REVIEW**

Not all SDG training should be biased in a positive direction but should be carefully critiqued and considered in light of other disciplines, such as theology. Cafferky (2015) provides a Christian critique of the UN SDGs and proposes a fatal flaw exists concerning Sabbath and shalom. In essence, the argument is the SDGs can be summarized as two egotistical arguments: provide for the poor and care for the earth. However, people’s self-interests take over and the lack of care for God or desire for spirituality with respect to a Sabbath rest, including allowing the earth to heal itself, will ultimately fail. It is also noted current collaboration attempts have been unsuccessful in Europe due to promises by top leaders with little top-down management and reinforcement of the SDGs at the local level by current institutions. The other issue is clashing cultures towards an agreement of what certain groups can agree with each other on certain terms, i.e. peace or “shalom.” Until these issues can be reconciled, the UN’s attempt at the SDGs is broken at best and will have limited results. However, the work continues toward a proximate good until a new, better model can be proposed and attempted.

In 2017, SDG Academy sponsored a course entitled “Macroeconomics for a Sustainable Planet” with Jeffrey Sachs, Professor at Columbia University, and Felipe Larrain, Professor at Pontificia Universidad Catolica de Chile and former Minister of Finance of Chile. The course’s main question was “Is a thriving global economy possible in an equitable and environmentally thoughtful way?” Topics included: purchasing power parity, gross domestic product, investment-savings liquidity-money model, labor markets, money, central banking, exchange rates, bank runs, bubbles, financial crises, inflation, the Phillips Curve, the intertemporal budget constraint, permanent income consumption theory, life cycle model, investment, fiscal policy, aggregate demand, current accounts, the open economy, economic growth, Solow’s growth convergence model, globalization, poverty, inequality, and the challenge of sustainable development. Note SDG Academy sponsors other content and courses related to education concerning the SDGs.

The SDG movement is reaching K-12 classrooms through the social media movement #TeachSDGs ([TEACH](http://www.teachsdgs.org/) SDGS). The site provides continuing education resources for teachers, such as a blog and other assets. These include events, videos, articles, and free training courses, including one by Microsoft.

ESD Expert Net has provided a PDF file describing education as the main avenue of informing others of the goals through the story, learning objectives, reflection exercises, ideas, and additional links to provide competency in critical thinking, systems thinking, anticipation, reflection, integrated problem-solving, strategy, collaboration, and self-awareness.

In the Jesuit Academy, schools are taking the charge from Pope Francis to think more about creation care and sustainability. According to Carver (2015), “Ignatian spirituality demands a critical awareness of the environment in our daily lives, moving us from a sense of mere stewardship of the Earth to a deeper committed covenant of membership in the order of creation.” Daily gestures concerning lifestyle choices, such as what to eat, how to transport, how to be clothed, how to be housed, etc., are a great starting point in considering if everyone on Earth could do that and if this is really a good idea for the next generation to inherit (Weis 2016). Kaltcheva et al. (2016) have found MBA students taught in Jesuit-led programs concerning sustainability have implemented practices in their businesses and in their own personal lives. Werner and Stoner (2018) are creating a new finance textbook incorporating the SDGs. Companies are tackling the SDGs individually. Visa is financially serving the underserved (no poverty). General Mills donates meals to food banks (zero hunger). Kaiser Permanente invests in healthcare (good health and well-being). LEGO funds children gaming (quality education). Participant Media teaches students internationally concerning Malala (gender equality). Kimberly-Clark gives toilets to the poor (clean water and sanitation). Cummins invests in solar power (affordable and clean energy). Microsoft teaches youth about computers (decent work and economic growth). Qualcomm gives wireless technology to the underserved (industry, innovation, and infrastructure). Citigroup values diversity as strength (reduced inequalities). Siemens celebrates cities fostering “green” answers (sustainable cities and communities). Nike uses recyclables in most products (responsible consumption and production). JetBlue teaches everyone about the changing climate (climate action). Discovery Channel invests in clean oceans (life below water). North Face donates to outdoor protection areas (life on land). AirBnB gives refugee relief workers places to stay (peace, justice, and strong institutions). TripAdvisor and GlobalGiving identify and support local nonprofits with SDG-related missions (partnership for the goals). These illustrate just a few examples of firms who have signed on with the UN (Embree 2016).

As the literature above demonstrates, these are all great starting points, but nothing specifically pertains to the course at hand, nor is openly available to the public. The next section details the attempt made in an introductory class of macroeconomics to students at a private Christian university in a quarter system over ten weeks of two sections of 40 students each.

**MACROECONOMICS CURRICULUM**

On the first day of the course, professors should discuss the syllabus and relay where the students will be going. Some language appropriate for free use to be edited or modified for one’s own use is available in Table 2. Specifically, discuss with the students your university’s affiliation with the UN, PRME, and the SDGs. First, be sure everyone understands what the United Nations is in context of the course: it is an international organization established after World War II to maintain order. All nations except the Vatican and Palestine participate. Next, if applicable, describe PRME as the channel through which the UN is educating the public concerning their 2030 goal of administering and testing the SDGs, which one can go into some detail on the first day, given other matters and time constraints. One can also note the UN PRME is the largest volunteer organization for universities to engage in order to gain recognition, gain access to collaborative learning communities, and provide communication through the Sharing Information on Progress (SIP) report to demonstrate how the university is contributing to the sustainability conversation and their carbon blueprint on the worldwide. Lastly, tell students more jobs require them to know about sustainability, which is a measure of last resort, but will get the remaining pupils’ attention.

SDGs can be linked to both current and historical events in the United States (or the university’s country) and globally. It is important to view them mainly through economic perspectives but also through the lens of firms and governments to see the big picture. Each module or chapter provides an opportunity for an assignment or activity related to one of the SDGs. In the class where this pedagogy was used, the textbook was an open source macroeconomics textbook published from Rice University (Greenlaw and Taylor, 2014), which is a low-cost or free option to students, encapsulating the spirit of the SDGs.

Not all modern-day market structures are like the U.S. Some are traditional, communist, or mixed with these two and the market model. Discussion and creativity early on via teams and/or individual assignments would provide students the opportunity to suggest ways to ensure equity and inclusion, regardless if cities or nomadic living is used (SDG 11).

After discussing the circular flow diagram, we introduce the notion sometimes the economic cycle could break if markets fail. We look at SDG Six, clean water and sanitation, with respect to recent events in the U.S. with water scarcity, drought, and wildfires to determine what might be the most efficient thing to do and were the tradeoffs involved in making these decisions ([How](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fstateimpact.npr.org%2Ftexas%2F2013%2F08%2F02%2Fhow-10-western-cities-are-dealing-with-water-scarcity-and-drought%2F&data=02%7C01%7C%7C286f240b196f452cbea308d55f668870%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C636519816343848379&sdata=bauN%2F90xkgkwLDUP4P3R9oX80TaxDdukxtVT6ayE080%3D&reserved=0) 10 Western Cities). The class can also discuss SDGs 13, 14, and 15 with respect to tradeoffs concerning efficiency with water scarcity, drought, and wildfires.

Introductory models of either the budget line with consumption bundles and/or the production possibilities frontier (PPF) provide opportunities to seek sustainable living (SDG 12). We also introduced the concept that the SDGs are interrelated through the production possibilities frontier, such as education and healthcare (SDGs Three and Four). We discussed why students came to college, what other universities they may have attended, and what they would have been doing otherwise. We then discuss data concerning how education and healthcare are related and what is happening in the Midwest, particularly in Missouri (Brown and Fischer, 2017).

After discussing the theoretical models of demand and supply, we watch a video concerning the crisis of South Sudan to pair with the Second SDG: zero hunger. This sobering reminder provides students opportunities to share stories of mission trips to other countries, stories of Africa, what would happen to the people if the current administration cut funding to the World Food Bank and other issues concerning when markets fail due to the atrocities of civil war (CBS This Morning).

Dependent upon the textbook choice, most consider economic growth solely (SDG Eight). This could be considered in context with poverty (SDG One) and consider if we could have a world with no poor. Growth requires innovation and infrastructure (SDG Nine). Along with the discussion of economic growth and/or unemployment, energy markets and the need for specialized labor and skills deployed in this sector can be deliberated (SDG Seven).

We then moved to financial institutions and how weak or strong they are, providing peace and justice (SDG 16) against usury (Usury Law). We discuss banking and trust in financial systems, as well as opportunities places like banks and other payday loan institutions, provide, such as The Money Tree, give to certain segments of the population that are not currently bankable or are deemed creditworthy.

A last example includes educating students via a clip from the show “Adam Ruins Everything” on labor markets in the U.S. It shows how firms take advantage of Americans thoughts on pay privacy to discriminate especially against people of color and women to pay them lower wages, which is against SDG Five, Gender Equality (Adam Ruins Everything; TruTV).

**ASSURANCE OF LEARNING**

In light of Table 2, one may ask how to assess understanding of the SDGs? One could do various activities associated with the SDGs to test understanding. One could assign a research paper assignment on a particular law to see the effects of sustainability progress and if it works. Similarly, the professor could ascribe a required research presentation in class or in front of the professor during regularly scheduled office hours. In class, give individuals tasks on policy implications, discuss tradeoffs, and/or work together in groups as more material is learned and discuss consequences regarding the SDGs. Testing via quizzes could also occur via memorizing the SDGs or content related to them for reinforcement and deep learning.

Table 3 provides an example of an editable sample final exam question used. This was placed as the last question on an essay test where students had six questions but were able to choose only five. Qualitatively, students did well and noted various tradeoffs to their decisions. For the most part, their answers were quite robust. Several students questioned the professor concerning brevity and need to address all of them, especially since the location was not Earth but Mars. This demonstrates critical thinking and care in not only their grade but in answering a question pertaining to power and control in creating a new world and a sustainable society.

Insert Table 3

Table 4 provides a qualitative assessment of how the responses match up with the question in Table 3. 77 students across two sections of introductory macroeconomics were given six essay questions and asked to complete five. Due to this, nine percent of the students left the question blank. Scoring the question based on mentions of the SDGs and tradeoffs (an 18-part question worth 20 points) yielded an average score of 38% (students who skipped the question are not included in the average). 71% of the students recognized tradeoffs and mentioned them in their answers. The most common SDG response at 62% involved the fourth one, pertaining to quality education. This may be due to students actively involved and in the environment of higher education already. The lowest common SDG responses at 9% was the last SDG number 17, partnership for the goals. This may be due to the last item on the list or lack of emphasis concerning this in the course since it pertains to macroeconomics and big picture theories, not a course that would focus on more institutional partnerships, such as political science or an economics course specifically focused on international trade. Several students made connections and noted a policy involved one or more the SDGs together. More work and thought needs to be placed on the individual SDGs to ensure these connections are appropriate and note to the students the significance of each individual goal. Also, future macroeconomics courses could focus more on policy implications and tradeoffs pertaining to each SDG.

Qualitatively the student responses varied widely in terms of length and depth. Many students had confusion about various governments; many responses pieced together the pros of a democratic republic and communism but did note tradeoffs and mentioned switching systems when the time was right. Some responses simply listed SDGs and had a lack of policies or their potential implications. Some students used prior answers to questions concerning supply and demand or fiscal and monetary policy to consider the SDGs in this light with varying degrees of success. One common note was the issue of water on Mars and whether or not it existed, how water could be transported to Earth, and the consideration there was not known to be habitable marine life on Mars, although some responses mentioned dealing with aliens and other potential forces unknown until arrival.

Future research could assess more quantitatively how students perform given a substantial treatment of the SDGs. One could also test this in various structures, such as using this as a pre-test assignment during the first week of class and comparing results. In addition, one could test this with a treatment group of a section of students who focus on the SDGs and a group who do not focus on the SDGs to see if intentional sustainability education improves outcomes.

**CONCLUSIONS**

Collaboration is crucial to achieving the goals, regardless of affiliation or affirmation with particular aspects of the SDGs, the UN, or ethical perspectives. One can agree we all can work to achieve a more sustainable planet. Through education, this can begin to see change and take root; perhaps, a future generation can develop a better solution to our current problem or provide answers to stem the tide of a growing crisis.

In business education, economics should not be the only course where sustainability is discussed. Obviously, economics tends to be the course of entry for almost all students, dependent on university-wide curriculum decisions and might carry most of the burden. Dependent on curriculum gaps and areas of improvement, one could argue for an entire course devoted to sustainability issues and capture each of the areas of business. One could also argue each course in the business curriculum devote a portion of their time to the issue in order to develop the whole business student. Tables 5 and 6 depict a graph illustrating just one example of a typical business curriculum with an emphasis on sustainability introduced via all courses and one of sole focus, respectively. Annan-Diab and Molinari (2017) and Weybrecht (2017) suggest incorporating sustainability across the various management disciplines (as suggested by Table 5).

Much is left to be discussed in the area of sustainability and education, especially pertaining to business schools. Future research should focus on all of the areas discussed in the above tables and include ways or test methodology concerning assessment and assurance of learning quantitatively and qualitatively. Long-term research studies could be conducted analyzing programs that emphasized the pre-requisite to the SDGs (the Millennial Goals) to test their impact from an education standpoint and now test the SDG impact of university graduates and alumni contributions to the conversation, which should be a section worthy of analysis and documentation in the SIP. Also noteworthy would be institutions devoted to attracting talent and developing programming specifically designed to focus on target issues and social justice problems that detract from achieving the SDGs, such as homelessness, poverty, hunger, institutional corruption. Through one institution, the university, signing off on working on this issue through UN PRME, we can all unite to mass educate and create an informed public that can change the world for the greater good.

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**TABLE 1: SUSTAINABLE DEVELOPMENT GOALS**

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

**TABLE 2: SAMPLE SYLLABUS LANGUAGE**

[Insert University or School] Program Learning Objective: Community

Students will demonstrate an ability to achieve management goals by working effectively in group settings by exhibiting servant-leadership, working in teams, showing evidence of global and multicultural sensitivity, and acting professionally.

Course Learning Objective: Consider sustainable development goals (SDGs) from the Principles of Responsible Management Education (PRME) in light of macroeconomic principles to develop a worldview considerate of the other.

**TABLE 3: SAMPLE FINAL EXAM QUESTION**

After not winning the Presidential race in 2xxx, Professor [insert professor name], you, and other unhappy voters board a SpaceX Rocket to Mars. In 2xxx, you land and begin a Utopia called [insert creative name]. You borrow from the United Nations the 17 SDGs (see next page). As Professor’s top economic advisor, suggest policies based on these, noting any tradeoffs you have to make.

**TABLE 4: ASSESSMENT OF TABLE 3**

|  |  |
| --- | --- |
| Percent | Item |
| 38 | Grade Avg |
| 9 | Skipped |
| 71 | Tradeoffs |
| 47 | SDG1 |
| 52 | SDG2 |
| 40 | SDG3 |
| 62 | SDG4 |
| 30 | SDG5 |
| 38 | SDG6 |
| 31 | SDG7 |
| 60 | SDG8 |
| 40 | SDG9 |
| 25 | SDG10 |
| 31 | SDG11 |
| 22 | SDG12 |
| 25 | SDG13 |
| 23 | SDG14 |
| 29 | SDG15 |
| 45 | SDG16 |
| 9 | SDG17 |

**TABLE 5: SUSTAINABILITY THROUGHOUT THE BUSINESS CURRICULUM**

**TABLE 6: SUSTAINABILITY DISTINCTLY SEPARATE IN THE BUSINESS CURRICULUM**