The EU Tempus Project: Reorienting University Curricula and Practicum to Address Sustainability (RUCAS)

Evaluation Conducted by the Institute of International Education (IIE), Stockholm University, Stockholm

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Introduction

The EU Tempus Project, Reorienting University Curricula to Address Sustainability was initiated to infuse Education for Sustainable Development (ESD) principles in higher education curricula and practicum across several universities in the Middle East and the European Union in 2010-2013. This is an evaluation that analyzed twelve reoriented courses from several universities in Egypt, Jordan, Lebanon, Dublin and Crete. And it examines the successful inclusion of ESD within each of the revised course. Evaluation was solely based on project papers submitted by each university.

Aim

The aim of the evaluation is to find out the progress of the RUCAS project and how the ESD concept was infused into different areas within course curriculums, teaching methodology, and practicum as well as how Teaching and Learning Activities (TLA) appropriated to impact on values, attitudes and behaviors that promote sustainable living. The overview of this evaluation has taken into consideration the following areas:

a) Teaching and Learning Activities (TLA),
b) Pedagogical strategies that had been used to integrate well-established pillars of sustainability,
c) Organization of curriculum contents and designing of courses
d) The institutionalization of sustainability (to influence values, attitudes and behavior)
e) Key innovative results and changes in micro and macro perspective,
f) The way in which challenges are identified and addressed.

Methodological Framework

The Five Pillars of EDS

The methodological framework used for this evaluation based on the five pillars of ESD, which are:

1) learning to know
2) learning to do
3) learning to live together
4) learning to be
5) learning to transform
These pillars were originally formulated by UNESCO (2005)\(^1\) as articulated by Delros as early as 1996 and later developed further adding the 5th pillar—learning to transform by UNESCO. We use these conceptual tools to evaluate how the curriculum, teaching and learning and practicum were organized by each course to influence values, attitudes and behavior towards improving quality education that foster a sustainable approach. In doing so, we also analyzed each project/course along economic, social, cultural and environmental axes. These pillars were taken as conceptual tools to identify good practice and as well as analyse the strengths and weakness of each project/course in integrating ESD principles.

The five pillars of ESD were defined and illustrated as follows: Learning to know— is more about how curriculum objectives are defined, teaching and learning activities are planned and assessment tasks are organized to give a deeper understanding of the sustainable development, education for sustainable future and its associated concepts. That means how the courses were organized to improve students’ declarative knowledge of sustainability issues in general.

Learning to do— is based on the idea of performances, knowing how to do things and overall how effectively a sustainable approach is infused to their discipline, practicum and daily work at classroom, school and university. Additionally, in how the overall course is designed giving openings so students have opportunities to put declarative knowledge into practice (procedural knowledge).

Learning to live together — is perceived as the vision for a better world in which the environmental, social, economic and cultural considerations are balanced, differences are met, equity and equality is promoted and diversity is embraced. Learning to be — is changing one as and when one learns. Self-evaluation, rethinking, learning to think new ways and are seen as some of the dimensions. Learning to transform— is transformative understanding; the sustainable behavior at the personal level can lead to changes in sustainability on a societal level. To achieve all these aspects courses need to have a well thought pedagogical methodology, Teaching and Learning Activities (TLA), Clear Intend Learning Outcome (ILO), coherent course organization and planning. In fact, it is important to take in that order to achieve positive results.

**Overview of Results**

This section provides a summary of results. This follows by an individual assessment of each project. In doing so, we identified good practice that has worked well and practices

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that need improvements. The individual evaluations were completed with summative assessments consisting of 12 figures that clearly show four cornerstones of that ESD juxtaposition, namely, environmental, social, cultural and economic and five pillars as mentioned above.

A total of twelve courses across the disciplines of agricultural, education/pedagogy, business, law political science and psychology were reviewed for this evaluation. The results showed that almost all universities successfully infused some element of sustainability within the curriculum and practicum in their respective courses and projects. Ninety percent of courses, students were given the opportunity through TLA to identify, differentiate, elaborate and justify different concepts of ESD. That means a majority of courses that were delivered had a pedagogical rich content giving students a reasonable declarative knowledge of SD and ESD; as to what kind of knowledge that is needed to be involved in order to infuse ESD. When it comes to adopting SD principles, the majority of courses did well. The course that was developed by Crete within the framework of the RUCAS that has an ICT component has a more up-to-date approach not only in related to transformative potential but also a coherent and egalitarian knowledge building, delivery and circulation.

Particularly, those courses that had practical elements and also courses that used multimodal pedagogical methods did well in achieving the ESD goals. It was also shown that existing courses that tried to integrate a sustainability principle as an added criteria did less well and ended up integrating only one or two elements of EDS. These courses need improvements when it comes to Teaching and Learning Activities (TLA), Teaching methodology in order to achieve Intend Learning Outcome (ILO) that infuses the ESD approach. That means how ESD approaches penetrate along the five pillars, as well as four cornerstones need to be taken into consideration when teaching is organized, learning activities are planned and ILO is outlined.

In order to achieve five pillars, which should be the ultimate objective of these courses; curriculum needs to be taken into consideration in socio-environmental, socio-economic and socio-cultural as well as socio-economic relevance in the knowledge building process. Important questions, reflections need to take place in related to human connection to the Physical and Natural World, Ethics and Values, Pedagogical Strategies for integrating sustainability principles. This was come across in 60 percent of courses where participants were given time to reflect their own practice, and the situation in which they are practicing. In fact these courses had a strong practicum element and required students to exercise active control over problems and challenges. Teachers act as facilitators or mentors. In such a way, students were given opportunities to plan, implement as well as seeing things in a new way and thereby got the possibility to be immersed in the topic. They were able to subsume declarative and procedural knowledge to a functioning knowledge much better than courses that had no practicum.
A Summative Assessment of Each Course

This section gives a summative assessment of each course. All 12 courses were evaluated using multiple assessment tools to find out how TLA, ILO (intend learning outcome) and pedagogical methods were planned to optimize SD objectives. It is important to note that some courses, such as courses related to agricultural science have advantages compared to other courses, which have various threshold concepts to deal with when infusing SD goals across different disciplinaries. However, they were evaluated taking into this aspect and difficulties therein into consideration.

Case 1: Suez Canal University, Egypt, Faculty of Agriculture

Second year students’ course curriculum was planned to optimize SD goals. The project base learning, tech-supported instructions and interactive engagements, and action learning completed with lectures improved achieving SD objectives in a highly satisfactory manner. The course was able to impact students’ values, attitudes and behavior towards living and changing old ways of doing by thinking differently. Students were practically exposed to sustainable modes of crop production (by introducing young plants that are resistant to soil borne diseases and thus need less synthetic fertilizer to combat diseases). An original preventive and innovative way to deal with environment unfriendly methods was smartly included in the practicum through a transformative pedagogical method used in this course. Using expertise in the field, the course demonstrated efficient grafting methods to reduce soil-bound diseases that otherwise needed Methyl Bromide, which causes harm to the ozone. Technology, as to how to mix organic and chemical fertilizers that protect the environment and sustainability of soil for agriculture in more economic friendly ways, helps students to reflect on theories and concepts they have learned, in a real life situation. This is to say the high practical orientation of the course helped to achieve a number of SD goals very effectively. The course definitely made an impact on institutional practice as well as at the community level where large amounts of the population are engaged in horticultural entrepreneurship in the area.

Case 2: Suez Canal University, Egypt, Faculty of Agriculture

Eighteen senior year students from the Faculty of Agriculture examined the SD impact through ‘field trip as a methodology as a part of the horticulture science curricula; in TLA mainstream, the ‘field trip’. Courses were infused to adopt sustainable production methods in agriculture. Students were well exposed to theoretical knowledge that explains different concepts, such as sustainable pest management methods, organic
farming, etc., prior to the field trip. Also being senior students, they already had obtained a higher declarative knowledge of the subject matter and therefore a field trip ideally enhanced their existing knowledge. An adequately planned field trip and subsequent field work gave opportunities not only to use the knowledge in a productive way, but also gave them the opportunity how to use, when to use, and why it is used—appropriating a holistic approach to sustainable agricultural practice in respect to pest management, production methods and organic farming through systemic thinking. The course has an elevated inclination to impact the entire institutional practice to promote ESD and students’ being given occasions to be aware of their agency for bringing changes.

Case 3: Suez Canal University, Egypt, Faculty of Education

The aim of the course was to assess the learning outcome of first year teacher students’ knowledge on sustainable development after infusing sustainable development to their course, namely—“role of principles of psychology in education for sustainable development.” The basic component of ESD is used as pedagogical material to internalize students’ understanding of SD. The objective of the project is to understand how students internalized value and skill development after following a course pertaining to principles of psychology that were reoriented to address sustainability. The paper that was presented was an assessment on students’ understanding of various SD concepts. In fact, a mixed-method was used to assess impacts on students’ values and skills concerning a sustainable future that shows a positive understanding. Students were given opportunities to have theoretical knowledge. TLA does not give any indication as to how sustainability aspects were integrated. Answers from students to questionnaires on sustainable issues indicated that students gradually deepened their knowledge of sustainable conceptions at the end of the course, but the way how this was achieved was not clear. It is a good initiative to gradually introduce an interdisciplinary approach where two different discourse communities start to communicate with each other, and this was seen in this particular course. This is a way forward in the direction of institutionalizing a sustainability perspective within the field of education psychology, but challenges need to be overcome by targeting it and building up pedagogical methods to bring forth changes.

Case 4: Suez Canal University, Egypt, Faculty of Education Psychology

This was a course that aimed to use an interdisciplinary approach to promote sustainability development within three psychology courses for psychology major students. The objective of the project is to measure, using mixed methods, to discover
how SD was internalized by students after the course in Experimental Psychology using an interdisciplinary approach. How this interdisciplinary knowledge is used to improve students understanding of ESD has delivered is not clear. The process of infusion of sustainability is missing in the TLA. Students were well exposed to work in an experimental situation to develop an interdisciplinary understanding of experimental psychology, physiological psychology and deductive statistics, but the question that needs an answer is how does that differ from a traditional interdisciplinary course from a course that infused sustainability? This is to say that a sustainability goal cannot be achieved merely by working with an interdisciplinary approach; it needs more effort to integrate and this needs to show clearly in TLA, and pedagogical methodology. This course looks like an attempt to infuse ESD to psychology and ESD pillars were addressed to a lesser degree.

Case 5: University of Jordan, Curriculum Instruction Department, Faculty of Education Sciences

The course was designed to address student teachers how to instruct mathematic in the light of SD. The course objectives are basically to identify mathematical concepts, skills and problem solving when teaching mathematics to 1-3rd graders. Mathematics curriculum focus mainly on teaching methodologies, however, with collaborative learning, peer teaching and group work it encouraged students to find some sort of insight into working together to find solutions. By reading the text it is difficult to determine how a sustainability approach to practical work is infused into teaching and learning activities or ILO. However, there is an operational learning outcome through collaborative learning and peer learning and teaching. It is recommended that substantial input of TLA as well as more innovative pedagogical methods are needed to achieve ESD goals. There are many mathematical methods that use natural material such as sand, water, leaves to measure, count etc. incorporated to the teaching methodology to achieve disciplinary thresholds, such as this course. This course looks like an attempt to infused ESD to an existing course. The course may need to be developed taking into consideration all four cornerstone as well as five pillars.

Case 6: University of Jordan, Faculty of Education Science

The course was intended student teachers, and curriculum was well designed and implemented using a variety of teaching methods to develop many various aspects of ESD. There is a wider visibility, as well as involvement, not only from the course participants but also from other stakeholders, such as faculty members, university as a whole, and community members. TLA was executed to optimize the participatory
process, a positive attitude towards ESD, develop strategies to close theory and practical gaps. The systematic thinking the way which TLA is arranged and pedagogy is delivered not only gave a positive impact on the university as a whole, but also young children in the community school. Theories and practices were well connected to achieve the entire SD goal in this project to include many SD pillars.

**Case 7: Notre Dame University, Lebanon, Environment Science**

The course was arranged as an outreach activity by Environment science major students to bring to the awareness of 12-15 years student groups on health and environment hazards caused by smoking. The course curriculum was well planned optimizing to achieve the ILO that promotes Sustainability Goals. The TLA consists of outreach activity not only to promote transformative and participatory action, but also to promote interactive engagements. This in return helps students to perform their coursework in a satisfactory manner impacting their own attitudes and behavior positively towards a sustainable future. Outreach activities in the course impacted not only the age group targeted by the environment science students at the university, but also the family members, neighbors and community by sensitizing the message. TLA, pedagogical methods and course organization gave students opportunities to subsume both procedural and improve declarative knowledge through practical elements, such as an awareness campaign, etc. Theories and practice were well connected to achieve the entire SD goals.

**Case 8: University of La Sagesse, Business Administration**

The course is intended for post graduates as part of their internship. The course was organized in a way and TLA would bring environment, economic and a social matrix together and also in cooperating sustainability elements to CSR (Corporate Social Responsibility). The course was well planned to give students a thorough knowledge of SD through lectures and study material. Students learn SD in the long run not only to act in an environmentally positive way, but also showing how it is economically viable and user friendly using working methods through ICT. In fact economic and sustainability is one of the bottle neck SD perspective faces in conjunction with economic gain activities. Students were successfully able to handle this challenge using innovative thinking and showing companies the economic benefit of alternative ways of thinking. Their higher level of declarative knowledge in both fields and practicum and systemic thinking helped them to use the knowledge appropriately to find workable solutions to some problems (how and when to do and why one should do it). So to speak they advocated SD professionally and convincingly so that companies have a win-win
situation by adopting SD principles. They did this by showing how to minimize cost and increase profits. Theories and practice were well connected to achieve the entire SD goal in this project.

**Case 9: Integrate SD in the Law and Political Science Programs**

This university wide program at the bachelor level cut across different institutions and has a program wide approach. The theatrical courses within the program that focus on designing and rewriting courses with an ESD infusion is rather promising and well thought out. The pedagogy is well structured to infuse ESD taking into consideration a number of steps, mainly by finding links and clarification of the boundaries between political science and SD, identifying individual concepts overcoming conceptual thresholds and difficult meanings. Challenges of the Infusion of ESD were well addressed to achieve ILO. Defining values through syllabi rewriting; teaching methods were advocated successfully. Such programs definitely made an impact on institutional practice. This is an on-going project that will have a good scope towards EDS.

**Case 10: Heliopolis University, Multidisciplinary University**

This project was implemented to improve students’ understanding of scarce resources and TLA was planned in such a way that students delivered—know and how—to a wider public. Course elements were planned by infusing the sustainability of water. The course definitely made an impact on institutional practice and community as a whole. TLA was executed to optimize the participatory process, positive attitude towards ESD, and develop strategies. Interdisciplinary knowledge to improve students’ understanding of scarce resources, such as water in Egypt is integrated with clear course objectives and appropriate learning activities. Students and communities were sensitized towards the sustainable use of water showing how. Students, as teams, approached different community organizations and institutes to convince and convey different methods that can be used to recycle water, conserving water, etc. to a larger group.

**Case 11: Dublin City University, UK**

This project was implemented to infuse sustainability in humanities and social sciences across 15 courses at Dublin City University (DCU). ESD Topics infused in DCU courses were Natural resources management, climate change, disaster prevention, energy management, citizen participation and good governance, wellbeing and poverty reduction, indigenous knowledge and ethnic groups, cultural diversity, gender equality,
peace and human security, health promotion, human rights, sustainable agriculture, corporate responsibility, ICT-enabled ESD, pedagogical Strategies for ESD. Majority of courses were fallen into specific domain such as Humanities and Social Science and this in a way prevented dissimilation ESD knowledge on Technological and Economic Relationships, how to balance environment, economy and sociocultural context and Economic activities as well as how Natural System Function. However, by looking at the diversity in topics that had been introduced, there was good coverage of the four cornerstones of ESD, to appropriate an understanding of basic elements of ESD and Sustainable living.

**Summative Evaluation of courses according to 5 Pillars & 4 Cornerstones**

The above section evaluated each course for their strengths and weaknesses in achieving ESD goals. Results show that the majority of courses did well infusing ESD concepts in at least one or more areas successfully, especially when it comes to first three pillars majority of revised courses were well integrated but learning to transform oneself and society majority of courses need to make more effort. This section takes a closer look at the courses using 5 pillars and 4 cornerstones, adopted by UNESCO and renewed at a number of subsequent conferences. The summarative assessments, explain areas of strength and weakness according to figures 1-10. In assessing, we take into consideration, the Teaching and Learning Activities (TLA), pedagogical strategies that had been used to integrate sustainability, organization and plan of courses to influence values, attitudes and behavior, the institutionalization of sustainability, and finally the key innovative results and changes and the way in which challenges were addressed along the 5 pillars.
Figure 1: Course No 1 Practical Training in production of Horticultural Crops

Figure 2: Course No 2 Field Trip as a main Method to deliver Horticulture Crop production
Figure 3: Course No 3 The Role of principles of psychology in education for sustainable development

Figure 4: Course No 4 Interdisciplinary approaches on Students knowledge, attitudes and achievements
Figure 5: Course No 5 Preparing Pre Service teachers to teach math for sustainable development

Figure 6: Course No 6 EDS- closing the gaps between knowing and experiencing, early childhood education for student teachers
Figure 7: Course No 7 Smoking Health Hazards awareness campaign among school students

Figure 8: Course No 8 Case study on Good Practice: Lebanon
Figure 9: Course No 9 Curriculum revision, implementation and dissemination of SD in the law and political science programs, University of Notre Dam, Lebanon

Figure 10: Course No 10 Good Practice ‘Water is life’, Heliopolis University
**Figure 11: Course No 11 Dublin City University, UK**

**Figure 12: University of Crete, Greece**
A summarative description of each course/project is given below in the Table 1: Five Pillars of ESD objectives

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<thead>
<tr>
<th>Course/Project Details</th>
<th>Learning To Know</th>
<th>Learning To Do</th>
<th>Learning to Live together</th>
<th>Learning to Be</th>
<th>Learning to Transform</th>
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<tbody>
<tr>
<td>1: Suez Canal University, Egypt, Faculty of Agriculture</td>
<td>TLA was excellently planned to optimize ILO &amp; SD objectives giving students a good declarative knowledge.</td>
<td>Learning by doing, students were given opportunities to put contents knowledge in diverse areas pertaining to the field with the infusion of SD into practice.</td>
<td>Student bodies worked in collaboration with communities, which they thought helped the agriculture community to achieve SD.</td>
<td>Students expressed global concerns and suggested different innovative strategies that could be used at local level ex. by promoting alternative to local products.</td>
<td>The course successfully achieved transformin g oneself and finding an avenue to direct others towards that direction.</td>
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<td>2: Suez Canal University Egypt, Faculty of Agriculture</td>
<td>Project base learning by way of field trips using inquiry and discovery based leaning helped to achieve cumulative of declarative and procedural knowledge.</td>
<td>Such pedagogical arrangements acquire a deeper knowledge to improve functioning knowledge as to how, when and what to do and for whom and why.</td>
<td>Getting away from the classroom context and learning during a field trip, also about learning together.</td>
<td>The combination of learning and socializing in a field trip that show different aspects of SD agricultural methods and promote a natural way of being.</td>
<td>The objective of the project was to bring forth changes using sustainable agricultural methods and this was achieved well.</td>
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<td>3: Suez Canal University Egypt, Faculty of education (psychology)</td>
<td>TLA was less clear. However teaching that was used to improve students’ knowledge and result therein tell us students have gained a declarative knowledge that means knowing about what kind of values, skills pertaining to SD.</td>
<td>The paper that was presented gives a little information of how the courses were implemented and which kind of teaching methods that was used; for ex: what kind of PBL (problem-based learning) that they were being exposed to work inter disciplinary. Considering this it is difficult to say as to which</td>
<td>Constructive alignment of the course work is not stated and therefore it is hard to know whether students acquire critical thinking when interacting with others. However, the course itself has a boosting element that helps students to internalize the concept of</td>
<td>There is no doubt this point is achieved through the course. But research conducted later on to find out their achievements did not come out well in the descriptive article to evaluate this point to be sure as to which extent participants have internalized</td>
<td>This could have achieved modestly with the declarative knowledge students were exposed to in this course. The course is in fact a slight move to the direction of institutionalization of SD which is a good</td>
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<td><strong>4: Suez Canal University, Egypt, Faculty of education</strong> (Psychology)</td>
<td>TLA was planned at top level. How disciplines should meet was not dealt enough.</td>
<td>Students were exposed to interdisciplinary knowledge within psychology. But the process of infusion of sustainability is missing.</td>
<td>There is a weak taxonomy of powerful verbs, which could have been introduced to ILO in order to stimulate critical thinking along 4 corner-stones of SD.</td>
<td>Students have a modest knowledge to use SD goals to think psychology.</td>
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<td><strong>5: University of Jordan, Curriculum Instruction Department, Faculty of Education Sciences</strong></td>
<td>TLA is mainly planned to improve collaborative learning with not specific strategy to infuse Sustainability approach. Weak attempt was made to include more fundamental Sustainability goals.</td>
<td>SD objectives could have been infused using material from nature such as sand, leaves and water to measure, count and draw shapes to teach math is popularly use worldwide. Because such discovery learning in action is highly effective for younger learning groups.</td>
<td>Stronger collegial help to build a community of practice in which students shared resources and ideas promoted sense of doing things together, solving problems together.</td>
<td>This element of SD is marginally mentioned without much strategy to show how it has implemente d and more transformati ve approach to teaching is desirable.</td>
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<td><strong>6: University of Jordan, faculty of Education Science</strong></td>
<td>TLA was excellently defined and designed to achieve ESD objectives. The higher level of declarative as well as functioning (procedural) knowledge was appropriated through TLA.</td>
<td>This is discovery learning in action. Learning material chose were highly effective for younger learning group where teachers were training to teach and this aspect was well demonstrated learning by doing.</td>
<td>Objectives were well target-specific in order to include larger groups in the community, purposely to include younger members. Course inspired small children who are going to be future</td>
<td>The course of this caliber was an excellent example for SD to thrive and bring forth changes at higher level. This course has achieved to transform and promote SD within the</td>
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<td>7: Notre Dame University, Lebanon, Environment Science</td>
<td>TLA was planned to optimize ILO &amp; SD objectives well.</td>
<td>There is a high participatory as well as interactive approach used in teaching methodology. Students were given opportunities to put contents knowledge of SD to test and practice.</td>
<td>Course in participatory and interactive and out reaching approach to address a community problem itself has a higher level of sustainable thinking. Also it gives an impression to the world out that universities are integrated learning communities of SD.</td>
<td>While students are engaged in the project there is a high degree of self-learning that has had impact on them.</td>
<td>The project through its methodolog y successful in bringing transformati on to larger group at various levels. Transformat ive element detected the way in TLA was organized and entire course was planned at the university level.</td>
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| 8: University of La Sagesse, Business Administration | TLA was planned to achieve how triple bottom line scenario (environment-economy-social) could be balanced by improving companies’ attitudes and knowledge on Sustainable approach to work. | Practical element in methodology that brings forth usage of IT to improve SD is highly effective. Students strategically exposed companies to see the synergetic effect along profit, people and planet to promote SD practice. | Students are expanding SD vision to Business communities. Feedback from fellow students benefitted all. | The combination of Learning communities and business communities is a vital part in infusion of Sustainability approach within ESD is demonstrated in this project. | Transformat ive element is highly effectual and students were well prepared as well as knew how to approach business tribes promoting win-win suggestions. |

<p>| 9: Integrate SD in the Law and Political Science Program | TLA was planned to optimize ILO &amp; SD objectives. Emphasize were put on | Such fusion by changing curriculum contents has a powerful effect as students acquire deeper | University-wide interdisciplinary approach making universities to be more | Although such approach are challenging goals were achieved by well-planned pedagogical | How to combine knowledge from different disciplines are inspiring |</p>
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<tr>
<th>10: Heliopolis University, Multidisciplinary university-wide water project</th>
<th>Curriculum to integrate SD objectives in a careful though manner.</th>
<th>declarative knowledge and critical thinking.</th>
<th>conscious of values, attitudes and behavior to promote sustainable values at institutional level using interdisciplinary approach is challenging but this program has high potential.</th>
<th>methodology.</th>
<th>at institutional as well as university level.</th>
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<tr>
<td>TLA was planned to optimize ILO &amp; SD objectives. Emphasize were put on Curriculum to integrate SD objectives</td>
<td>Practical element in methodology coherently used to improve water habits amongst university communities. Students strategically exposed companies to see the synergetic effect along profit, people and planet to promote SD practice</td>
<td>Student centered learning project that was encouraged to advocate not only enhanced their self-understandin g of Sustainable usage of water but also important in spreading the knowledge at societal level by working in groups</td>
<td>Student centered learning project where teams work dealing with threshold concepts from different disciplines gave a solid foundation to advocate the project</td>
<td>Students strategically involved different stake holders to show the synergetic affect when using water sparingly to larger communitie s, which also included their own university.</td>
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<td>11: Dublin City University, UK</td>
<td>Courses were planned to optimize knowledge around larger number of ESD components within Social Science and Humanities.</td>
<td>Course contents appropriate a deeper declarative knowledge on sustainability particularly issues associated with sustainable living, sustainable futures, on consumption practices that balance</td>
<td>Students overall showed a positive disposition towards active citizenship, respecting diversity which is valuable elements of ESD.</td>
<td>This was achieved modestly with the declarative knowledge students were exposed to in this course.</td>
<td>The course is in fact a slight move to the direction of institutional ization of SD which is a good beginning but need to improve by integrating ESD to other</td>
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### Conclusion

The notion of ESD is a concept that universities, as well as most educators grapple even though it had been endorsed more than decades ago. The reasons are many but the most overriding difficulty lies in the aspect of infusing an ESD approach to different disciplines. Some disciplines, such as agriculture and social science, ESD concepts are easy to integrate but same cannot be said to some disciplinary domains such as law, mathematics, or economy. There are many thresholds concepts and problematic conceptual challenges that need to overcome in order to fully integrate ESD in a plausible manner so that infusion can have a fruitful potential. Another aspect is it is difficult to isolate concepts from its context (subject area), this is challenging even problematic when it concerns integrating and balancing economic, environment and social and cultural aspects which are the cornerstone of ESD. However, I must say that the majority of courses evaluated that cut across different disciplines brought ESD themes to light to bring forth changes at the micro and macro level successfully taking
into consideration local needs and global concerns. This is to say they sensitize well, thinking globally but acting at the local level. Some of them that were achieved were human connection to the physical and natural world, attitude and behavior changes, how the natural system functions and why it is important; technology and economic relations to development, and how to strike a balance between planet, people and profit. This was done as they progressed in their TLA. They were encouraged to think differently and this is a good beginning to bring forth changes. Learning communities were exposed well to different concepts related to ESD particularly sustainable living, sustainable consumption habits, respecting diversity and community spirit. The course presented by University of Crete is a promising way to bring ESD and SD concept closer to learning communities in egalitarian manner using latest technologies.

One of the most challenging parts of ESD is to integrate economic mode to promote sustainable development. Students in some of the courses professionally were able to suggest, demonstrate as well as implement activities to overcome challenges. Motivating sustainable behavior and what kind of pedagogical strategies and TLA one can use to integrate ESD were the courses that were managed to integrate the most number of sustainable pillars. Nevertheless, a majority of courses evaluated were taught and, the practicum was organized to represent a transformed way of understanding, interpreting and viewing of different sustainable concepts. To a certain extent, there was a transferring of discourse from one discourse community to another. They were detected to a point that students were exposed to the need of searching for new conceptions and/or conceptual changes in order to get a big picture when trying to integrate sustainability elements in their own disciplines. Although, this posed a challenge, but as mentioned earlier, with the help of innovative TLA some courses successfully managed to deal with troublesome knowledge. Finally, it is important to say that in order to institutionalized SD practice need integration of sustainability at a strategic level at higher level within universities.