

ECOSOCIAL COLLEGE FORMATION TO FULFILL SUSTAINABLE DEVELOPMENT OBJECTIVES

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Abstract

The objective of this article is to analyze the curricular experience called 'Social Project Design' oriented towards university students developing social innovation projects, aimed at the Sustainable Development Objectives (SDO). Via active-participative methodological strategies, 267 students identified problems in their environments and proposed contextualized solutions. Based on the work done, 81 projects were designed by students during the 2020-2021 period, using the analytical framework of the SDO for their evaluation, which provided the opportunity to gradually incorporate sustainability into study plans from a complex systematic perspective which integrated reality. In this study, for the first time, we analyzed and went into curricular experience and university participation, considering elements of active listening, participation and adaptation in the search for solutions to current socio-environmental problems, transforming actors into ecosocial change agents.

Keywords: Change agents, Ecosocial Curriculum, Sustainable Development Objectives, University Formation, Social Innovation.

1. INTRODUCTION

Currently, the global environmental crisis obliges us to re-think the way of teaching in the university. In this sense, education is a tool to transform students into change agents in their communities by seeking innovative solutions and generating development opportunities from a local focus supported by a vision of sustainability and social justice. Institutions such as the United Nations Education, Science and Culture Organization [UNESCO], the Organization for Economic Cooperation and Development [OECD] and the World Bank have called on the educational system to provide their students with new skills to analyze and detect the real demands of their environment (OECD, 2009) and thereby contribute to socioeconomic development (Heyneman and Lee, 2016). In particular, higher education must respond to the challenge of forming students to face the environmental crisis and social inequalities, moving from learning as the acquisition of something given following prior development, to an acting type of learning as an emerging response to the world which it problematizes and interacts with (Fontalvo-Peralta and Castillo-Hernández, 2018; Leiva-Brondo *et al.*, 2022; Menon and Suresh, 2020). In this context, new trends such as ecosocial education arise, which push people towards reflection and action, orienting teaching towards ecological and social transformations. In the face of these cases, Universities are interpellated to



teach professionals to be agents of ecosocial change, endowed with skills associated with collaboration, commitment, equality and sustainability.

Regional universities, in their commitment with the territories where they exist, face the challenge of Connection with the Medium (CwM), which involves maintaining systematic and permanent links based on dialogue with actors in civil society, the public sector and the private sector, which impact the territory and institutional tasks. This implies taking on collaborative actions whose results contribute to teachers' academic activities and research, as well as collaborating with developing the surroundings, valuing its realities and providing varied answers according to various needs.

In this scenario, the present article analyzes the experience with university students who via active participative methodological strategies can identify problems in their surroundings and design social innovation projects which pay tribute to Sustainable Development Objectives (SDO), and how these formative actions favor transforming the student into an ecosocial change agent. We recognize the education plays a crucial role, forming a new generation of leaders capable of slowing down the ecological crisis (Worldwatch Institute, 2017) and of thinking about society in terms of sustainability and social justice (Martínez, 2018).

2. LITERATURE REVIEW

2.1 University, teaching and skill development

Universities are currently facing the existence of new educational models, which manage to respond to social and cultural scenarios "which present not only a new, different administrative and academic organization, but also a political one" (Orozco-Alvarado *et al.*, 2019, p. 76). These places must shape individuals "not only prepared for efficient production of assets and knowledge, but also committed with the development of their country and humanity; individuals who can handle large amounts of information, making innovative decisions and developing in diverse work contexts" (Narro, 2014, p. 144). To achieve this, the teaching-learning model moves from a static focus wherein students were passive subjects of their own learning processes towards a dynamic model where students are actively centered with the intention of training them in achieving skills (Ruiz-Rosa *et al.*, 2021). For Bernate and Vargas (2020) "students represent the center of education, motivated by a search for knowledge, and most importantly a passion which allows social transformations from their actions" (p. 143). Seeking education today demands flexibility and adaptation, making it important to "learn how to learn" by joining theory with practice (Pugh and Lozano-Rodríguez, 2019). This strongly coincides with the mission of the university itself which alludes to the commitment of integral formation which involves "a solid human formation with teaching centered on the person and their learning process; that is, in teaching to learn" (Crespi and Garcia, 2021, p. 300).

In this perspective, teaching constitutes one of the key activities of higher education institutions linked to forming people and, therefore, oriented towards helping students develop "the necessary skills for them to face the complex and uncertain world in which they will participate as professionals. When well done, there is potential for students to achieve learning regardless of their socioeconomic origin. It is able to inspire and transform people, expanding the horizons of their possibilities" (González, 2015, p. 373).

Quality university education cannot remain anchored in the development of specific skills of a disciplinary environment, but must rather consider other, more cross-sectional or generic skills linked to citizenship, ecology, social justice, and more. However, it should be recognized that the university world has traditionally stood aside from these topics; this gives more urgency to the question of the social responsibility of Higher Education institutions and the scope of the education they provide.

There are currently various educational models oriented towards teaching professionals with broad knowledge in various disciplines. However, "some of these models lack an ethical component, which leads to the formation of professionals indifferent to environmental conservation and even species preservation" (Estrada and Pinto, 2021, p. 170). Continuing with the same authors, "it is necessary to speak about education for sustainable development when facing the topic of integral formation, since sustainable development refers to the relation between humans as well as human relations with the environment which they inhabit" (p. 170). In line with this, university formation must favor students' capacity for innovation and adaptation (Bonnefoy, 2021), which leads to permanently evaluating the pertinence of the declared skills.



One current challenge faced by Higher Education is to integrate education into social and productive processes, giving rise to changes in the teaching-learning system which respond to new social contexts' demands. To this end, the skills-based model involves developing a complex learning which, among other motives "requires learners to integrate scientific, day-to-day and professional knowledge, in a single learning scenario and subsequent professional exercise" (Cuadra-Martínez *et al.*, 2018, p. 20). This implies that a qualitatively new mission for education in new conditions must be centered not only on disciplinary knowledge, but also on building skills and particularly those skills oriented towards practice and territories (Kulik *et al.*, 2020). The aim of these models is to improve educational relevance for personal and work life, to satisfy labor market and social development needs (Brauer, 2021). Starting from the basis that the university and its duties, including teaching, must generate an impact on the world which we inhabit today, there is a demand for renovation of educational designs vis-à-vis a learning scenario which is swiftly changing, valuing "whether these respond to the formation demanded from the person, citizen and professional of this millennium so as to know how to face a future marked by complexity and uncertainty in the face of increasingly swift change" (Ruiz-Corbella and López-Gómez, 2019, p. 13).

2.2 University, SDO and social innovation

Along with developing skills and the challenges implied by this formative model, universities can consider SDO and the Agenda 2030 for Sustainable Development plan in order to find opportunities to materialize teachings sensitive to social needs. To be concrete, these objectives define actions oriented towards combating inequality in the face of structural problems such as climate change, sustainable economic growth, productive capacity, peace and security, and gender equality by having effective, responsible and inclusive institutions in all areas (Ramos, 2021, p. 91; Kioupi and Voulvoulis, 2019).

A teaching proposal oriented towards promoting attitudinal change among students requires curricular integration of the problems declared by SDO (UNESCO, 2015), and thus, a transformation in the very concept of teaching-learning processes (Leal *et al.*, 2019; Albareda-Tiana *et al.*, 2018). From the perspective of Unesco, education must help people in various walks of life be able to understand, propose and implement solutions to problems related to planetary sustainability in a more organic relation between subjects and their nature.

With this in mind, integrating SDO into various university study plans constitutes an opportunity to shape citizens of the world, promoting global citizenship via the concept of "glocal" experiences in local communities to the extent that students work in association with communities (Upvall and Luzincourt, 2019, p. 649). This also helps contribute to the global agenda from university research, as one of the social commitments with the community (Dibbern and Pavan, 2021).

By using a focus with a critical and collaborative nature, higher education institutions can participate in sustainable social change and even be in line with the civic mission of the institution (Gregersen-Hermans, 2021, p. 461). In this situation, social innovation and sustainable development should "constitute learning objectives in higher education in all disciplines" (Dryjanska *et al.*, 2022, p.108)

From a perspective of sustainable development and social justice, Agenda 2030 (Naciones Unidas, 2018) calls for rethinking the teaching process by preparing students to face current social and ecological crises. This is especially clear in Objective #4 which seeks to "Guarantee inclusive, equitable, high-quality education and promote permanent learning opportunities for all". Goal 4.7 states "By 2030, ensure that all students acquire the theoretical and practical knowledge needed to promote sustainable development, among other things via education for sustainable development and sustainable lifestyles, human rights, gender equality, promoting a culture of peace and non-violence, global citizenship and valuing cultural diversity and the contributions of culture to sustainable development".

Given this situation, and according to the declarations by Gradaille and Caride (2018), Martín-Bermúdez (2019) and Aleixo *et al.* (2020), there is an intention to transform socio-educational reality from an "eco-social" position, which relates environmental education, social economy and the systemic focus of education, for the promotion of a transformative education and active citizens. Riera (1998, p. 45) explains it as "a systematic, grounded action favoring the development of sociability in the subject, promoting their autonomy, integration and critical, constructive and transformative participation within the sociocultural framework surrounding them". In this sense, the active role which the teacher must assume is fundamental to guide knowledge construction with an impact based on active and significant learning, where the student reflects and works collaboratively to create solutions to problems diagnosed in their own surroundings. The foregoing

is in order to create active citizens, conscious of the needs of the environment and their society, where teaching for sustainable social development is a skill to be included in university teaching models in order to link with real problems present in social, organizational and community spaces (Juárez-Hernández *et al.*, 2019).

In a scenario with social transformations and important challenges, universities are called upon in their public role to gradually institutionalize their social commitment (Acosta *et al.*, 2021) into academic tasks so as to tend to social needs. This assumes a new paradigm regarding the “ivory tower” within which institutions acted, which have traditionally developed vertical, tutelary and assistance-based relations with the external environment, so as to install the notion of bidirectionality and, therefore, of social innovation. It should be recognized that innovation always has a social dimension, since innovations contribute directly or indirectly to satisfying human needs, thereby influencing living conditions and, therefore, society. Furthermore, innovation requires a favorable social context (Pastor and Balbinot, 2021, p. 104)

Social innovation arises as a tool to provide creative solutions to the problems and needs of society (Dawson and Daniel, 2010), or as indicated by Weerawardena and Sullivan (2012) and Concha *et al.* (2020) its objectives include solving social problems. Social innovation implies developing and implementing new ideas (products, services and models) to satisfy social needs and create new collaborations or relations by fomenting capacities for action (García-Flores and Palma, 2019; Hubert, 2011). This innovation can contribute to answering the formative demands of the 21st century and the search for a meaningful education, since “it invites us to the collective construction of new realities and practices in educational communities, whenever declared educationist” (Roa, 2017, p. 116).

Similarly, Howaldt (2019) presents a new paradigm of social innovation characterized by three principal aspects, which are closely interrelated and mutually beneficial: (1) their orientation towards major social challenges, which must incorporate emerging knowledge to solve daily life problems, (2) greater recognition of non-technological innovations oriented towards social practices, and (3) designing innovation processes that are open to society. Integrating education into social innovation in the curriculum this way, as indicated by Valdés and Gutierrez (2021), can help improve the study plan in any subject area by focusing on creative social problem resolution, skill-building and behaviors for training students as change agents.

This social innovation, according to the statements of Pastor and Balbinot (2021), seeks to tend to “the existence of market failures, income distribution inequality, environmental impacts arising from human life, and shortfalls in infrastructure and basic services, which much of the global population face” (p. 111) and thus favor fulfilling SDO.

3. METHODOLOGY

In this section, we will analyze the experience with university students who use participative active methodological strategies to identify problems in their environments and design social innovation projects which fulfill Sustainable Development Objectives (SDO). All of this has the ultimate goal of favoring the formation of young change agents in their communities and/or neighborhoods from a sustainable ecosocial perspective.

This experience integrates various disciplines, within the framework of a curricular course/activity within the general education area called “Social Project Design”, whose aim is to formulate projects with social impacts that contribute to answering emerging needs in the local and regional environment.

The study period covers 4 academic semesters during the years 2020-2021, and saw the participation of 267 students from various disciplines including Pedagogy, Engineering, Nursing, Psychology, Medicine, Public Administration and Agronomy.

Table 1. # of Students per Semester

Year	Semester	# of students
2020		84
	First	55
	Second	29
2021		183
	First	122



	Second	61
Total		267

It should be mentioned that during this period, due to the COVID-19 pandemic, curricular activity took place via online classes, with students in their communities/neighborhoods working under strict health measures.

The curricular activity took place in stages. The first stage included theoretical learning in: a) designing projects in social innovation and Sustainable Development Objectives; b) Design Thinking participatory active methodologies, information gathering techniques, logical frameworks, and more. A second stage was oriented towards putting learnings into practice. To this end, students were invited to organize into work groups by affinity. Next, each student group had to carry out a diagnosis which gathered up the needs and/or problems of the community/neighborhood in order to design projects to contribute solutions.

The work methodology focused on people-centered processes such as the Empathy Map, which helps understand others and their surroundings from their point of view, and Design Thinking techniques to find solutions aligned with the context. Both techniques favor co-creation processes and establish dialogue channels with the community/neighbors, etc. The intention is for students to favor, within the project design, the participation of the community in seeking out pertinence and sustainability for the actions being proposed.

To explore the problems of the community/neighborhood, the students implemented the Empathy Map. According to Hall and Schwartz (2019) empathy is a multidimensional, dynamic and relational concept: (a) a co-creative practice by both the empathizer and the empath; (b) An experience which is fundamentally directed towards others without losing connection with oneself; (c) An interpersonal process which is bidirectional, interactive and dynamic and which requires tuning in and a capacity for continual response; (d) A quality of a relation where empathy can flourish based on qualities such as openness, identification and trust.

This empathy is necessary during the problem analysis and exploration phase, where the main objective is to gain comprehension of the user or community, considering contexts, aspirations and culture. During the next phase, empathy is also crucial for students and community participants to work on achieving a shared comprehension of the problem in order to imagine possible collaborative solutions. Observation is used to look beyond individual or personal filters to see from the perspective of another. Empathy ensures broad representation of knowledge in the process (Gasparini, 2014).

Specifically, the empathy maps allows us to categorize user knowledge from the interviewer/designer via qualitative research (interview transcriptions, research notes, survey responses), increasing the relevance of students' in-depth interviews to obtain user data. The "SAY" square should contain what the user says out loud in the interview, ideally containing direct textual quotes. The "THINK" square shows what the user thinks during the experience. Based on the data gathered, one must answer: what are the thoughts of the user? What is relevant to them? The "DO" square contains the actions of the user. What do they do physically? How do they do it? The "FEEL" square represents the emotions of the user. What worries the user? What enthruses them? How do they feel with the experience?

After finishing the empathy map, the students begin the Design Thinking process. According to Razzouk and Shute (2012) this is generally an analytical and creative process involving a person with the opportunity to test, build, create prototypes, gather comments and redesign. The structure of Design Thinking creates a natural Flow from research to the final service/product. For the formulator, in this case the student, being part of the design process for user/client experience gives them relevant information which transforms into knowledge, aiding teams to collaborate and agree on design criteria to use for generating solutions that can better approach users' real needs.

Essentially, Design Thinking elevates the importance of using strategies which allow for 1) understanding the problem to be approached, 2) generating alternative solution-centered ideas and 3) participating in solution pilot tests. We can currently observe that design thinking is a promising focus for social innovation (Berzin and Catsouphe, 2015). The process specifically has the initial opportunity exploration stage which includes understanding or empathizing, observing and defining, and the second solution exploration stage which includes brainstorming, prototyping and validating. According to Zeivots (2021), Design Thinking is a positive influence on education, given that it implies creative thinking to generate solutions for problems. That is, it influence academic environments where students are required to read critically, think and reason logically to solve

complex problems. This methodology also recognizes the following characteristics in the “Design Thinkers” that use them, which are expected to be recognized in students. According to Razzouk and Shute (2012, p. 336) these characteristics are:

Table 2. Development of expected skills in students from Design Thinking

Characteristic	Description
Concern centered on human beings and the environment	Designers must continually consider how what is being created will respond to human needs, as well as both environmental and human interests as principal design process restrictions.
Visualizing skill	Designers work visually (i.e., they represent ideas).
Predisposition towards multifunctionality	Designers must seek different/multiple solutions for a problem, bearing in mind the general outlook for the problem while focusing on its details.
Systemic vision	Designers should handle problems as system problems with opportunities for systemic solutions involving different procedures and concepts to create a holistic solution.
Using language as a tool	Designers must verbally explain their creative process, forcing invention where details are lacking and expressing relations which are not visually obvious (i.e., explanation should go together with the creative process).
Work team affinity	Designers need to develop interpersonal skills allowing them to communicate between disciplines and with other people.
Avoiding the need to choose	Designers seek alternatives in competition before moving into decision making. They try to find ways to create new configurations. This process leads to a solution which avoids the decision and combines the best possible options.

The preceding is recognized as part of the vital skills to teach students to be more resilient to the future that lies ahead, where they will have to drive social, political, economic and cultural changes allowing them to inhabit the planet more sustainably (Worldwatch Institute, 2017).

Additionally, with the objective of designing a project which can broadly gather diverse community/neighborhood perspectives, using the methodology of the logical framework the students carried out a data validation process. This methodology allows for preparing project design logically and systematically, and its emphasis is oriented towards the objectives, the beneficiary group, facilitating participation and communication between interested parties (CEPAL, 2015).

Following this methodology, the students had to organize the work in stages. The first identifies the problem and alternative solutions, analyzing the existing situation to create a vision of the desired situation and selecting strategies to achieve it. The second stage corresponds to planning, building a practical operating plan to execute. The logical framework matrix is developed in this stage, including activities and required resources which are represented in a Gantt chart.

Via this validation process, students designed a consensual co-created social innovation proposal with the community, in line with Sustainable Development Objectives.

4. RESULTS

With the aforementioned process, 81 projects were designed by students during the 2020-2021 period, using the analytical framework of the SDO for their evaluation (Perović and Kosor, 2020), which grant the opportunity to gradually incorporate sustainability into study plans from a complex, systemic and reality-integrating perspective (Poza-Vilches *et al.*, 2021).

4.1 Projects Designed and SDO undertaken

For the ecosocial projects formulated, student teams analyzed the problems detected in their communities (McBeath *et al.*, 2021; Mawonde and Togo, 2019) in order to begin the ideation process. On this basis, they carried out reflections around SDO for them to follow and the specific goals to which they contributed with the proposed solution. We observed that the largest proportion of formulations was associated with SDO11 to achieve sustainable cities and

communities at 30%, SDO12 for responsible production and consumption at 25%, and SDO3 for health and wellbeing with projects focused on this at 17%.

Table 3. % of projects by Sustainable Development Objective

11. Sustainable cities and communities	30%
12. Responsible production and consumption	25%
3. Health and Wellbeing	17%
4. Quality Education	7%
16. Peace, justice and solid institutions	6%
6. Clean water and sanitation	5%
Others	9%
Total	100%

After reviewing the specific goals of each SDO identified in the projects, we can highlight that 22% of proposals seek to solve problems related to waste prevention, reduction, recycling and reuse within communities. Second place for the most work proposals, at 21%, refers to the rise in inclusive and sustainable urbanization, with third place being reducing non-transmissible diseases and mental health at 12%.

4.2 Projects Designed and subjects considered

Meanwhile, the most notable subjects considered by the projects include Quality of Life at 25%; in second place, Road Infrastructure at 17%, and in third place Recycling at 16%, all based on problems arising within their own communities. The list of themes is presented hereinafter:

Table 4. # of projects by topic

Quality of Life	20
Road Infrastructure	14
Recycling	13
Education	6
Environment	5
Improved public space	5
Eco-education	4
Mobility	3
Water	3
Others	8
General total	81

4.3 Projects Designed and territory

Regarding the projects' action setting, the territorial scale is at the neighborhood level. 65% of them are focused on solving neighborhood problems:

Table 5. # of projects according to action setting

Neighborhood	53
Town	21
Regional	7
General total	81

When considering the perspective of the population benefiting from the projects, we can see that 75% of the proposals are focused on solving problems among families within the student teams' communities and families:

Table 6. # of projects classified by beneficiary population

Families	61
Students	8
Animals	3
Seniors	3
Others	6
General total	81

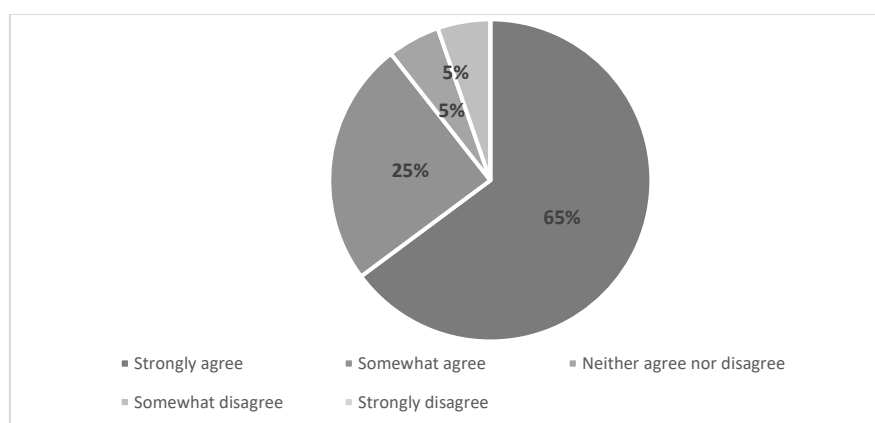
Among the principal key actors with which the students had to connect for project development, 42% referred to Municipalities being fundamental to achieve the projects while 19% and 13% respectively required participation from Neighborhood Associations and Civil Society Organizations.

4.4 Student evaluation

To know about students' motivations, a question was asked after finishing each semesterly course: After finishing this course, do you feel motivated to participate in an initiative in your community or to carry out a project in the territory where you live? 75% replied 'strongly agree' or 'somewhat agree' to this affirmation.

Upon analyzing responses to the question, Do you feel like you learned skills to become a change agent? we can see that 65% of students replied 'strongly agree' to this affirmation while 25% said 'somewhat agree', indicating students' interest for this integral formation.

Figure 1. Student perception regarding the acquisition of skills to become agents of change



5. DISCUSSION AND CONCLUSIONS

Following the analysis carried out here, we reach the following conclusion:

Universities are called to develop their tasks in alignment with territorial realities. In this sense, students' learning must be pertinent to contexts, which requires not being circumscribed to merely developing skills within the disciplinary sphere, but should also consider others of a more cross-sectional or generic nature linked to citizenship, ecology, social justice, and more. In this perspective, experiences such as those reported in the present article constitute a way for university tasks to not remain at a remove from these topics, but rather to act on their social responsibility.

In general, universities develop academicist educational models oriented towards various disciplines, not responding to current social needs which require the formation of ecosocial change agents. In this sense, implementing social innovation tools in university formation via the Empathy Method, Design Thinking and the Logical Framework aid students' recognition of problems in their communities, along with the importance of collaboration in solving contextualized problems in the environment, thereby contributing to making pedagogical focuses more pertinent to sustainable ecosocial development which forms an important part of current social challenges.

The experience investigated confirms the possibility of university education not excluding “the ethical component, leading to the formation of professionals indifferent to environmental conservation and even species conservation” (Estrada and Pinto, 2021, p. 170). Thus, students - future professionals - can experience an education which sensitizes them to territorial demands and the communities where they must ultimately work.

Following this perspective, students who go through this course can connect with territorial needs based on various methodologies. However, the projects formulated have a local/neighborhood outlook and pertinence. The task for university education is to open up reflection for them to recognize that the problems considered, while local, are also global as they are part of structural social problems. This would help promote global citizenship by giving sense to the “glocal” concept used by Upvall and Luzincourt (2019).


Similarly, working with Agenda 2030 helps students to visualize that their local problems are global and contained within SDO. Thus, when designing their projects they can be conscious of their role as transformative change agents from an ecosocial education. To achieve this, formative actions such as those implemented in this experience favor collaborative and critical work within higher education institutions for them to achieve participation in sustainable, inclusive social change, aligned with the civic mission of the institution (Gregersen-Hermans, 2021, p. 461).

Having said that, integrating SDO in various university study plans is an opportunity to shape global citizens and for universities to contribute to the global agenda from their research, as a social commitment with the community (Dibbern and Pavan, 2021).


Finally, when higher learning institutions consider formative activities for their curriculum linked to social demands, students can visualize a meaning apart from formation. We conclude that via experiences like these, students acquire skills to become change agents, favoring participation, teamwork, change adaptation, and active listening, all relevant elements for co-constructing solutions to approach modern socio-environmental problems.

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