# Triangle Issues of Sustainability at the University Level within a Vision of Knowledge Economy and Society

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Abstract-The paper focuses on the importance of the knowledge economy and society, emphasizing the significance of the triangle issues (Innovation, Sustainability, and Higher Education) for building a sustainable campus at the university level and preparing students to face the upcoming sustainability challenges in the competitive and sustainable world. Within a framework of the knowledge economy and society, the paper discusses the significance of sustainable campus, triangle issues and potential action plan for the university level. It makes mention of the emergence of a knowledge-based economy and society as well as the necessity of combining innovation, sustainability, and education to create a sustainable campus at the university level. The paper outlines nine significant issues or challenges related to a sustainable campus that have been emphasized, and cross-linked with each other. Optimistically, it will be a milestone in higher education, a pathway to meet the imminent sustainable challenges of the completive world and be able to manage the knowledge economy and societal system

*Keywords*—Triangle issues, sustainable campus, higher education, knowledge economy, knowledge society.

#### I. INTRODUCTION

THE paper highlights the direct association between I innovation, sustainability and higher education and their increasing central role in the economy and society through innovative gateway. It proposes an integrated approach as a helpful strategy for addressing the sustainable campus faced by higher education institutions, e.g., university. The innovation, sustainability, and higher education are the vital issues of the knowledge economy and society. In fact, the concentration of these triangle issues, educators and researchers convinced the learners to prepare productive citizens for the knowledge economy and society, and many initiatives have been launched in a campus level of a university and worldwide. The concept of knowledge economy requires simultaneous and balanced progress in three dimensions (Innovation, Education and Sustainability) those are totally interdependent and correlated. Moreover, the sustainable education system of a university must be the foundation for building inter-relation to the triangle issues that is necessary to create knowledge-based economy and society, which must manage the innovation approach and tools. Our proposed knowledge mediation platform's 'ePLANETe'

approach and tools indicate the trait of knowledge-based economy and society hubs that is required to establish a sustainable campus at university level. Now the Innovation, Sustainability and Higher education are becoming more and more central in our economy and society, and those are directly associated to the possibility of global wealth distribution to the economy and social system.

The proposed ePLANETe blue can mostly be utilized to address most of the challenges of sustainable campus. It is a digital archive of the intellectual product created by REEDS Research group for the purpose of best practices of education, sustainability, and innovation for the faculty, research staff, students, communities and stakeholder of an institution and accessible to end-users both within and outside of the institution with few if any barriers to access. It is also a digital knowledge platform that can be decertifying the online deliberation, experimental assessment data collected by institution members during assessments and observations that support to the scholarly activities of education, sustainability and innovation. We can say that the ePLANETe blue is a very powerful idea that can serve as an engine of change for institutions of higher education. If properly developed by the locally, regionally, nationally and globally governance, it advances a surprising number of knowledge economy and society's goals, and addresses an impressive range of education, sustainability and innovation challenges.

#### A. Research Aim

The research aims to define sustainability issues at the university level and identify the innovative tools of sustainability assessment for best practice, within a vision of knowledge economy and society. The aim also is to demonstrate the knowledge-based economy and social paradigm and its relevance in creating opportunities for sustainable campuses for the development of higher education institutions, e.g., University. The paper addresses the question of how higher education institutions can manage the knowledge-based economy and societal system with an integrated approach that combines innovation, sustainability, and education. The question is related to the adoption of new innovative platform and technologies for the assessment of the actual sustainability level and scale of the university, and fulfillment of the strategic gap from multi-criteria and multiactor assessments

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#### B. Source and Methodology

The paper employs collective action, existing works, and collaborative project capabilities of the ePLANETe system to investigate the mechanisms and strategies of a sustainable campus accommodate the triangle issues using the innovative kerDST deliberation method, which incorporates the corelation features of knowledge economy and society.

#### II. LITERATURE REVIEW

The education system is the fundamental vehicle for the dissemination of knowledge, and strong links between the knowledge base and the education system promote the transfer of knowledge. The globalized markets, the technical and technological revolutions are transforming the modern economy into a *"knowledge based society*" in which new ways of organizing the work are governing the world, demanding a perpetual buildup of competences, a rapid spread of high performance technologies, solid knowledge and increasing responsibilities [4]. Indeed, the link between knowledge and sustainability makes it possible for us to visualize that the sustainability paradigm is the essential frame for the knowledge society [5].

Higher Education Institutions (HEI) are involved in knowledge generation and creation, and transfer of knowledge to students, as well as to the community. Universities are placed at the intersection triangle issues for generation of knowledge. Close links between society and HEI generated communication that proves to be an indispensable force in progress [8]. The knowledge gained through education via HEI gives strength to a person, as well as to society, enabling them to face the new challenges of the modern world with confidence [9]. Well-formulated higher education policies and procedures stimulate deep analytical intelligence, positive attitudes, skills, and competencies for solving solution. Finally, it makes a skilled person who can share an optimistic influence to economy and society [8], [9].

Digital technologies will transform the way education is delivered, supported and accessed, and the way value is created in higher education and related industries [7]. Global mobility will continue to grow for students, academic talent and university brands, with the likely emergence of a small number of elite, truly global university brands [7]. There are lots of changes and challenges in the HEI, students are changing, and their learning styles are changing as well as their demands [8]. At the same time, much more has been expected of institutions in terms of their wider engagement locally, regionally, nationally and globally [1]. Universities need to prepare students for a more global knowledge economy in near future [1]. HEI around the world face the growing problem of relevance as they enter the twenty-first century [2].

Recently we identified twenty Higher Education (HE) challenges facing 21<sup>st</sup> century's HE based on different literature [3]. We identified- curriculum design/alignment; student retention and employability; widening participation; quality of learning and teaching; quality of research; funding,;

emerging technology; new generation of staff; assessment; accreditation of HEI and programs; compete and collaborating globally in research and talent; tenure; group formation for learning and teaching; critical thinking and argumentation; construction of personal and group knowledge; contribution to economy; integration of knowledge capital and cross-curricular initiatives; and HE governance and management as the burning challenges in today's HE [1], [8]. The details of those challenges can be found in a literature review of HE challenges and data infrastructure responses [3].

From the view point of 21<sup>st</sup> century challenges, the academic institutions including universities have increasingly recognized that an institutional knowledge portal is an essential infrastructure of sustainable campus at higher level education. Our proposed ePLANETe blue is that type of knowledge portal which is capable to face the best practices of sustainable campus for all HEI by the operative ways.

#### III. THEORETICAL BACKGROUND

Like all other human organizations, HEI are sizable, complex, and adaptive social systems. There have many difficulties in HE over the past ten years, such as- teaching level sustainability to the improving the quality of learning and teaching via multi-criteria evaluation methods; fostering an effective interdisciplinary curriculum design; designing effective and innovative courses linking towards inclusive and equitable quality long-life learning for all; linking students to work experience and Job opportunities that is relating to the knowledge economy; globalization; funding; campus level sustainability to the establish sustainable campus (green campus, green building green transportation, campus preservation); effective learning environments; technology facilitation mechanism for building effective partnerships for education; and the implementing innovating ways to the adopting new technologies; transformation of education to the portal based on knowledge; building capacities and empowerment. The current expansions of the worldwide mediation of web portals and new solicitations of virtual reality to build simulated learning atmospheres are forecast to have predominantly melodramatic effects upon learning atmospheres at all levels.

Nowadays, HEI are exploring with cultivating accessibility to existing programs, re-designing new programs to take benefit of these developing technologies, and are marketing their programs to new viewers and in new ways. HEI are also involved in investigation and have shaped both new organizations interior to the establishment and brand-new coalitions with universities to promote learning using knowledge mediation gateway. Completely new models for universities are also being developed to respond to the opportunities created by a growing worldwide market for learning and new technologies [10]. As a result, there is a dynamic environment of competition between traditional universities that are adapting administrative, research and learning process, alternative non-traditional universities that are utilizing innovative technology to better serve their communities and emerging the promise of virtual

environments. Seven emerging organizational models of HE are placed in modern education arena and each of them represents organizational efforts to respond to new educational, learning opportunities to increasingly global in scope and of critical importance to individuals, organizations, communities, and governments at a national and international level [10]. Most of the models deliberated are resulting from investigating trends, features and examples of emerging organizational practice

In the literatures and own observation, we can categorize the challenges that our higher education institutions are currently facing into groups based on their interrelationships and influences, such as Group1: Education, Group 2: Innovation and Group 3: Sustainability. Mostly, we have found nine common issues on challenges of education, sustainability and innovation [8]: towards inclusive and equitable quality education and long-life learning for all; sustainability strategies of HE; globalization; promoting education for sustainable development; sustainable development at HE; sustainable campus: green campus; transformation of education; building capacities and empowerment; and the technology facilitation mechanism for building effective partnerships for education. We have grouped those challenges in the perspective of a knowledge transformer/knowledge portal i.e. 'ePLANETe blue'. This ePLANETe blue is intended to assist the identification of best practices at specific levels of action, and to encourage knowledge exchanges in "virtual community", and thus it is to improve education, sustainability, and innovation performance through the engagement of collaborative activities of different sorts [8], see Fig. 1. Precisely, challenges in group3 influence the challenges in group2 and challenges in group2 influence the challenges in group1 and also if any of the challenges in group3 improve its quality or efficiency then the challenges influence or interrelated with/by this challenge will automatically improve their quality or efficiency.

Moreover, we will demonstrate all of those challenges, and identify the feature of proposed ePLANETe blue (latest version of ePLANETe) that can address these challenges with the help of technological way. Indeed, the ePLANETe platform is a "Knowledge Gateway" to the digital solution of Science, Technology and Innovation (STI) for implementing sustainability and dynamic balance of ecosystem through the members of the ePLANETe Blue Association. It is also a multi-faceted digital approach to innovation and sustainability for future challenges of knowledge society and economy through the practicing digital eco-system model with many different doors. The different surfaces of ePLANETe as a capacity building resource communication and are complementary by design affect user behaviors and outcomes. A historical reminder has been carried out to retrace the evolution of the ePLANETe Knowledge mediation Gateway [14]. Indeed, the ePLANETe has its roots in partnerships with the KerBabel Team since 2000 at C3ED (until 2009) and then at the International REEDS Center (2010-2015) at the University of Versailles-St-Quentin-en-Yvelines.

| SL | DORWAY            | FUNCTION                                   |
|----|-------------------|--|
| 1  | TALIESIN—BUILDING | It proposes the discovery of training      |
|    | KNOWLEDGE         | programs and teaching aids carried out     |
|    | PARTNERSHIPS FOR  | within and outside the University of       |
|    | SUSTAINABILITY    | Paris-Saclay.                              |
| 2. | VIRTUAL ECO-      | It offers the opportunity to discover the  |
|    | INNOVATION        | eco-innovations, evaluate their            |
|    | FAIRGROUND (THE   | performance and the challenges of the      |
|    | ECONOMIC          | governance of the green economy and        |
|    | DIMENSION)        | the circular economy.                      |
| 3. | TOUTATIS (THE     | This doorway aims to present the           |
|    | SOCIAL DIMENSION) | members of the communities and the         |
|    |                   | partners as well as the activities. These  |
|    |                   | Communities are organized and              |
|    |                   | presented via Profiles in three cross-     |
|    |                   | linked galleries, using complementary      |
|    |                   | logics of identity: Persons; Partners      |
|    |                   | (institutions, or operational units within |
|    |                   | an institution); and the User              |
|    |                   | Communities themselves.                    |
| 4. | CAMELOT — JUSTICE |  |
|    | & ENVIRONMENT     |  |
|    | (THE POLITICAL    |  |
| _  | DIMENSION)        |  |
| 5. | MERLIN — ACCENT   | The Doorway 'Merlin', by its name,         |
|    | ON OUR BEING-IN-  | connotes a desire to establish a           |
|    | NATURE (THE       | mediation between society and its          |
|    | ENVIRONMENTAL     | environment. The aim is to discover the    |
|    | DIMENSION)        | environment through the virtual gardens,   |
|    |                   | biosphere cycles, environment-economy      |
|    |                   | accounting systems, and economy-           |
| 6  |                   | environment models                         |
| 6. | KERBABEL          | It is composed of the galleries that       |
|    |                   | provide a body of knowledge pieces,        |
|    |                   | objects which will be mobilized in other   |
|    |                   | galleries of the other Doorways            |

Fig. 1 ePLANETe Doorways [9]

Today, it is made up of 24 distinct Galleries, each allowing the creation, consultation and operation of one or more classes of electronic "objects", the latter responding to a variety of discovery opportunities for deliberation support tools [9]. Objects can be linked to each other, in logic of reciprocity that can be found par excellence today in social networks. At the top level, the Galleries are grouped together by Thematic/ Functional Spaces (number 12) which provide the methodological context for the operation of the tools and Object Galleries that they host. Access to the Spaces and Galleries is made through six large "Doorways» which articulate: the User Communities (the TOUTATIS door), the principles of technical organization (KERBABEL), economic, environmental and political dimensions (the FAIRGROUND, MERLIN and CAMELOT gates, respectively), and, learning and training activities (TALIESIN). To conclude, we have illustrated the use of all of ePLANET's galleries by mobilizing skills for deliberation around "Knowledge Hot Spots" - that is to say, the structuring of controversial subjects characterized by uncertainties, high stakes and the diversity of perspectives, values and positions within a company [9], [14].

#### IV. FRAMEWORK

HE is a dynamic partner in the development of sustainability, human, and dynamic future for the global knowledge economy and society. In order to understand the

progress of sustainable university and the HE for sustainable development in the world over networks, social network

theories might help [8], [9].



Fig. 2 Triangular Framework for Knowledge Economy and Society

According to the proposed triangular framework (innovation, education and sustainability) in purpose of a sustainable university campus, the only viable way to achieve a systematic direction for long-term development of curricula and learning methods address the challenges and solution of sustainable university. The 'open networking' scenario and platform are the best ways for practicing the campus level sustainability of the university. In this respect, HEI accounted for more than a third of all voluntary commitments made at RIO+20, with commitments from over 300 universities from around the world [8]. Through its strong association with the united nation, HEI provide a unique interface between HE science and policy making. All HEI can freely join the network that is part of the association commitments. To establish the sustainable campus, we need to exercise green growth framework; share knowledge, information and experience feedbacks relating to territories innovation strategies and their implementation modalities via knowledge mediation gateway. The HEI believes in its ability to federate public and private actors of its territories to develop innovative projects in sustainable development and to build together an open-minded platform to meet the 21st century challenges of innovation, education and sustainability. Even if, it is a phenomenon deeply connected with meeting new demands coming from a globalized economy and society that is increasingly modulating the way we teach and learn, requiring new methodologies [11], open networking and knowledge platform as solution. In addition, higher education as well as knowledge economy and society face many challenges,

including how to identify and train for innovation while taking into account sustainable university's requirements. This is a major concern, as innovation, education, and sustainability are complex issues that require attention to the rapid dynamics of the way the knowledge is produced and transfers today. The increasing networking of the university and the harmonization of systems allow university's communities to choose their sustainability target and design their own sustainability framework. Our proposed knowledge mediation gateway 'ePLANETe' is a multi-faceted approach to the sustainability practices and it is a good example on how this can be articulated for the strongly connected case of innovation, sustainability and education. It is also an open networking solution that helps us to resolve the new issues or challenges of education, sustainability, innovation as perspective of knowledge economy and society. It also works as a knowledge transformer like the up-to-date dot technology.

#### V. RESULT AND ANALYSIS

The kerDST deliberation process provides for three main phases or forms of participation by real persons as "actors" in the evaluation [12]: The first phase of stakeholder participation is to "build the problem", a process that, one way and another, culminates in the definition of a 3-D array: (1) the key stakeholder or social actor classes, (2) the relevant spectrum of performance issues and (3) the range of evaluation objects (e.g., HE establishments, business strategies, industrial sites, projects, territorial development

scenarios, technologies, investment options...) to be evaluated. Many people may participate in conversation before or throughout the actual process of 'building the problem via the online deliberation support tools,' even though one person will be empowered as a special KerDST User to be the problem holder [8]. Second coat is for those who, in their capacity as legislators representing a group of stakeholders, pass judgement on each evaluation alternative e.g., as a site or scenario in relation to each performance criterion or issues. Each stakeholder should provide a judgement (satisfying, poor, unacceptable, etc.) of each alternative scenario in connection to each of the important concerns or decision matter by focusing on each cell of the Deliberation Matrix [13]. One judgment is made for each actor or stakeholder in this process, and a specific class or stakeholder makes the layer of the matrix up of a rectangular array of cells where each row represents the evaluation made for each option or scenario. The ability to expand the evaluation undertaken and motivate each cell level judgment by reference to indicators constitutes the third type of stakeholder participation. This method can be applied to a variety of surface, such as the range and weighting of indicators for a 'basket' of indicators within a 'cell' of the DM, as well as user community assistance in creating lists or banks of indicators that are appropriate for the current challenge

#### A. Online Deliberation Support Tools- KerDST: Multi-Stakeholder with Multi-Criteria Assessment

In this system, exercises or tasks are organized using a 'grid' or arrangement in three dimensions, structured by specifying selected problems [8]:

- Assessment/Government issues: few noticeable quality/ performance issues
- Main types of actors or stakeholders: the pragmatic delineation of 'interest' and collective identity
- Political options or possible future prospect: small number of options for actions and decision scenarios

If the task is to evaluate a specific activity or to compare several situations, then the user can specify a site or sites rather than scenarios [8], [12]. From the above three aspect of the KerBable deliberation support process, we have understood that the forms of genuine stakeholder engagement are intrinsic to the process of mobilizing indicators and evaluating or reporting evaluation results at the unit level and then aggregated at a higher level connection. If we continue to use KerDST as a methodological case study, we need to examine more carefully the interplay between assessment structures and participant contributions. In 2006, the KerDST [14] online deliberation support tools integrated two main functions into a basic framework for comparing Multi-Stakeholder, Multi-Criteria Assessment.

First, as already mentioned, are the mobilizing indicators by way of a base for the CELL BY CELL judgements [13]. These indicators are listed and accessible online 'ePLANETe' interfaces with the deliberation matrix in a matching "KerBabel<sup>™</sup> Indicator Kiosk". In this course of participatory

evaluation, user of the deliberation matrix can participate to the formulation of catalogue.

The second is the acceptance of multiple participants as members of an online deliberation community, each of which is associated with one of the stakeholder categories indicated in the deliberation matrix (DM) for the social choice problem under consideration and contributes to the formation of a consensus on CELLS comprehensive judgment of the DM, corresponding to this specific stakeholder category. We identify the four primary ways to utilize the potential of the KerDST system by combining these two qualities. The tabular arrangement that follows summarizes: "The simplest method is "colouring in the cells" by single representative of each stakeholder category of by a single expert acting on behalf of all stakeholder categories for a qualitative multi-stakeholder multi-criteria assessment of a situation or option for action (this is Variation 'A' in the schema)" [13].

The variation 'B' represents to contribute the multiple participants for a composite judgment of each issue or CELL. On the other hand, towards variation 'C', where a single expert acting on behalf of all stakeholders creates a 'nonparticipatory' evaluation for supporting societal goals [8]. Noted that the "default option" suggested for color codes is RED for bad, YELLOW for moderate and GREEN for good; users can, if they wish, define their own list of judgments and corresponding colors [13].

# B. Auto Evaluation Method of Strategic Demonstration on Sustainability [9]

We have developed and proposed an innovative way, tools and approach of assessing sustainability on university level benchmarking university UVSQ and UPSalay by the 'ePLANETe's Deliberation Matrix. There are 3 axes in the deliberation matrix that applied for the auto evaluation process [12]:

- There are four perceptions: [8] (A) Research/Means; (B) Research/Objects; (C) Education/Means, (D) Education/ Objects.[8]
- Performance Issues [9]: (built using crossings of the triangle: Education, Sustainable development and Innovation): (1) Towards inclusive and equitable quality education and long-life learning for all, (2) Promoting education for sustainable development, (3) Transformation of education landscape: (4) Sustainability of HE, (5) Sustainable development goals (17 goals), (6) Building capacities, empowerment, (7) Improving learning processes and outcomes, (8) Green economy, (9) Technology facilitation mechanism for building effective partnerships for education [9].
- The objects to compare are organized around three themes
   [8]: Mediation program, UVSQ, and Coordinator of
   GTDL Program of University Paris Saclay (UPSalay)

It is necessary to choose from 1 to 5 indicators to assign a value, a subjective weight, and a comment (if possible) in order to reach a conclusion [8], [9].

- Choose "Dark green aimed at <u>"Strongly in Favour"</u>
- Choose "Green" aimed at <u>"Favourable"</u>

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- "red" aimed at "Poor"
- "Orange" aimed at <u>"Medium"</u>

- "white" aimed at <u>"Do not know"</u>
- "blue" aimed at <u>"Not Applicable</u>

| Mention GTDL M2 | MEDIATION M2 ECONOVIN  | G   |      |        |   |                |                |                |
|-----------------|--|---|------|--------|---|----------------|----------------|----------------|
|                 | Education/   |   |      |        |   | Education/     | Research/M     | Research/O☑    |
| Quality Ed 🗹    | Switch to view<br>Indicator<br>Doorway TALIESIN<br>Gallery Broceliande<br>Gallery Yggdrasil  | Judgement       X     +       Medium     Y       X     +       Strong     Y       X     +   | Weak | Medium | Strong Weight 0 0 0 0 0                             | Switch to edit | Switch to edit | Switch to edit |
| Promoting SD 🗹  | Switch to view<br>Indicator<br>Gallery FoodBaskets<br>Gallery Kerbabel Ind<br>Gallery Virtual Gard<br>UE_Analyse, gouverna<br>Gallery Kerbabel Del | Judgement       X +     Medium       X +     Strong       X +     Medium       X +     Strong       X +     Strong       X +     Strong | Weak | Medium | Strong Weight 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Switch to edit | Switch to edit | Switch to edit |
| Transforma 🗹    | Switch to edit   |   |      |        |   | Switch to edit | Switch to edit | Switch to edit |
| SD_Strateg 🗹    | Switch to view<br>+ Add<br>Indicator<br>Gallery K4U<br>Projet Systèmes d'in  | Judgement       X +     Medium       X +     Very strong  | Weak | Medium | Strong Weight 0 0                                   | Switch to edit | Switch to edit | Switch to edit |

Fig. 3 Indicators baskets in the Deliberation Matrix [13]

Quantitative or Qualitative indicators may be used to express one's judgment in order to be more explicit about the evaluation process. The indicator is used in its broadest sense, which is to say it encompasses all information related to the PERCEPTIONS that has a stake in expressing its opinion. in this case, the meaning that the indicator allows to prove in order to issues the judgment is what matters, not its quantification and qualification.

| Object to compare (research/means) 1/issue 1 |       |                   |   |  |  |  |
|--|-------|-------------------|---|--|--|--|
| Indicators                                   | Value | Subjective Weight | Comment   |  |  |  |
| Indicator 1 <sup>2</sup>                     |       | 15%               | Lié au transport<br>routier<br>/Linked to road<br>transport |  |  |  |
| Indicator 2                                  |       | 15%               | DCO < 125 mg/1  |  |  |  |
| Indicator 3                                  |       | 15%               | Diversité des<br>espèces                                    |  |  |  |
| Indicator 4 <sup>2</sup>                     |       | 20%               | Baisse 10%  |  |  |  |
| Indicator 5 <sup>2</sup>                     |       | 35%               |   |  |  |  |

Fig. 4 Object to Compare [13]

For a particular perception, the first level of interpretation presents the findings of the assessment of all the comparable objects and the stakes (slice of the matrix) in the following manner: There will also be a 'slice 'of the matrix for other categories of actors. At the second level of interpretation, we will be able to identify for each PERCEPTION/OBJECTS/ISSUES Crossing the indicators and the arguments used to make the judgment (see Fig. 5 on how to compose a judgments) [9].

We can analyze the results as follows. For the object of comparisons 1, we obtain the following judgments at the first level of interpretation, see Fig. 6.

In addition, we will have access to all the crossed PERCEPTION/ISSUES as the second-level identifiers. Note the criteria and justification that were employed in the judgments.

### C. Outputs of the Quality Evaluation Process

Two output results of the automatic are presented (Fig. 7) in the 'ePLANATe' System. The general views of the result of the auto evaluation are a multi-colored picture, respectively for the education and knowledge economy. For details interpretation see Fig. 7.

#### VI. CONCLUSION

In order to manage the societal system of knowledge-based economy and ensure the sustainability of a university at the campus level, the paper emphasizes the significance of an integrated approach. The paper makes recommendation for higher education institutions or universities that can employ collective action method through the proposed assessment procedures and use the innovative ePLANETe space to accommodate this integrated pattern the can helpful for global wealth distribution to the knowledge economy and society.

The paper affirms that recent demand of sustainable campus at university level notably influenced the internal sustainability assessment for sustainability competencies by the proper evaluation process and takes necessary action for establishing a sustainable campus at university level in the vision of knowledge economy and society. Due to the university's length and size, the sustainable campus at university level requires a sophisticated evaluation method. The 'ePLANETe' system concept includes a deliberation matrix, and an online assessment system called kerDST that is intended to define and evaluate sustainability standards, and university sustainability practices criteria for sustainable campus. As per the analysis, the evaluation tools and approach of 'ePLANETe' perfectly fit for the quality sustainability assessment of a sustainable campus at university level and fill up the gap for sustainability practices. This helps in maintaining dynamic balance within the university's campus communities and sustainability practices



Fig. 5 First level of Interpretation [8]

|         | PERSPECTIVE | PERSPECTIVE | PERSPECTIVE | PERSPECTIVE | PERSPECTIVE 5 |
|---------|-------------|-------------|-------------|-------------|---------------|
|         | 1           | 2           | 3           | 4           |               |
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| ISSUE 2 |             |             |             |             |               |
| ISSUE 3 |             |             |             |             |               |
|         |             |             |             |             |               |

Fig. 6 Judgments of First level Interpretation [9]

## Education and Knowledge Economy

| Mention GTDL M2 MEDIATION   |                |                                     |                |                |  |
|---|----------------|-------------------------------------|----------------|----------------|--|
|   | Education/     | Education/                          | Research/M     | Research/0     |  |
| Method CETLU     M2 MEDIATION     M2 ECONOVING       Quality Ed2     Switch to edit     Switch to edit     Switch to edit       Quality Ed2     Switch to edit     Switch to edit     Switch to edit       Promoting SD 2     Switch to edit     Switch to edit     Switch to edit       Transforma2     Switch to edit     Switch to edit     Switch to edit       SD_Strateg2     Switch to edit     Switch to edit     Switch to edit       Sustainabl2     Switch to edit     Switch to edit     Switch to edit       Building c2     Switch to edit     Switch to edit     Switch to edit       Switch to edit     Switch to edit     Switch to edit     Switch to edit       Switch to edit     Switch to edit     Switch to edit     Switch to edit       Sustainabl2     Switch to edit     Switch to edit     Switch to edit       Sustainabl2     Switch to edit     Switch to edit     Switch to edit       Sustainabl2     Switch to edit     Switch to edit     Switch to edit       Switch to edit     Switch to edit     Switch to edit     Switch to edit       Switch to edit     Switch to edit     Switch to edit     Switch to edit       Switch to edit     Switch to edit     Switch to edit     Switch to edit | Switch to edit |                                     |                |                |  |
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| Transforma 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| SD_Strateg 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| Sustainabl 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| Building c 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| Improving ., 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| Green econ 🗹  |                |                                     |                |                |  |
|   | Switch to edit | Switch to edit                      | Switch to edit | Switch to edit |  |
| Technology 🗹  |                |                                     |                |                |  |
|   |                |                                     |                |                |  |

Fig. 7 Auto Evaluation of Sustainable Education and Knowledge Economy [9]

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