

Impact of Green Information Systems on Corporate Sustainability: Evidence from multiple case studies in Southern United States

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The Catholic and
Marianist University



Project Overview

- Role of Information Systems in environmental sustainability
- User perceptions on use of Green Information Systems
- Multi-method approach (Survey and Case study)
- Insights to help energy policy-making

Motivation & Goal

- Growing public concern about the environment, increasing emphasis on corporate social responsibility, and introduction of an array of government policies and regulations on sustainability issues
- TBL (Triple Bottom Line)
- To investigate whether quality aspects of green IS influence their stakeholders' use and satisfaction – Ultimately add to environmental sustainability

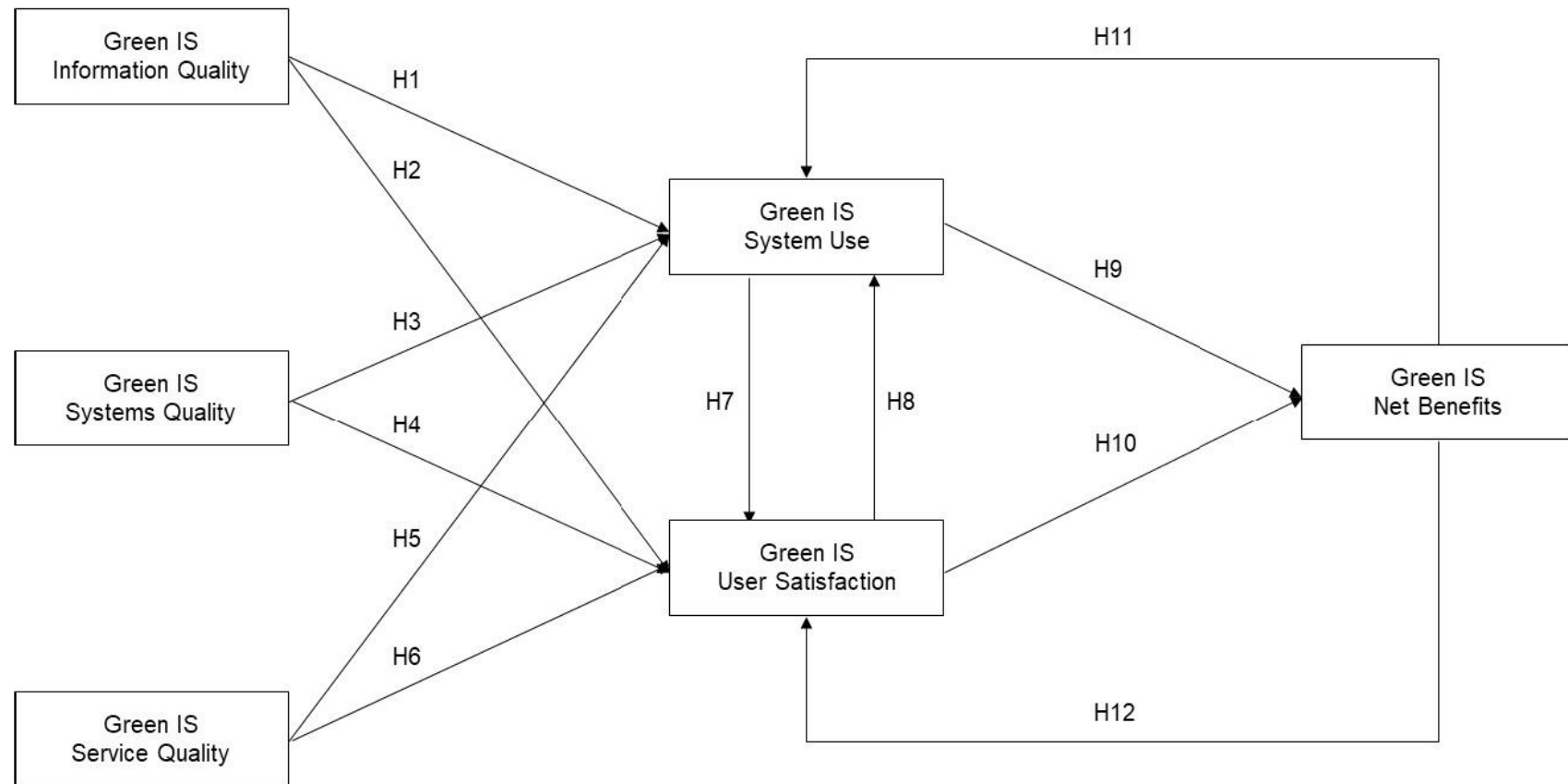
Theoretical Framework

- IS Success model (Delone & McLean, 1992)
- Theory of Planned Behavior (Ajzen, 1985 & 1991)
- Theory of Reasoned Action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980)
 - *These theories intend to link behavior from beliefs and attitude with a mediation of intention. TPB states that three predictors (behavior beliefs to attitude toward behavior, normative beliefs to subjective norm, and control beliefs to perceived behavior control) will influence behavior intention and then subsequently affect actual behavior.*

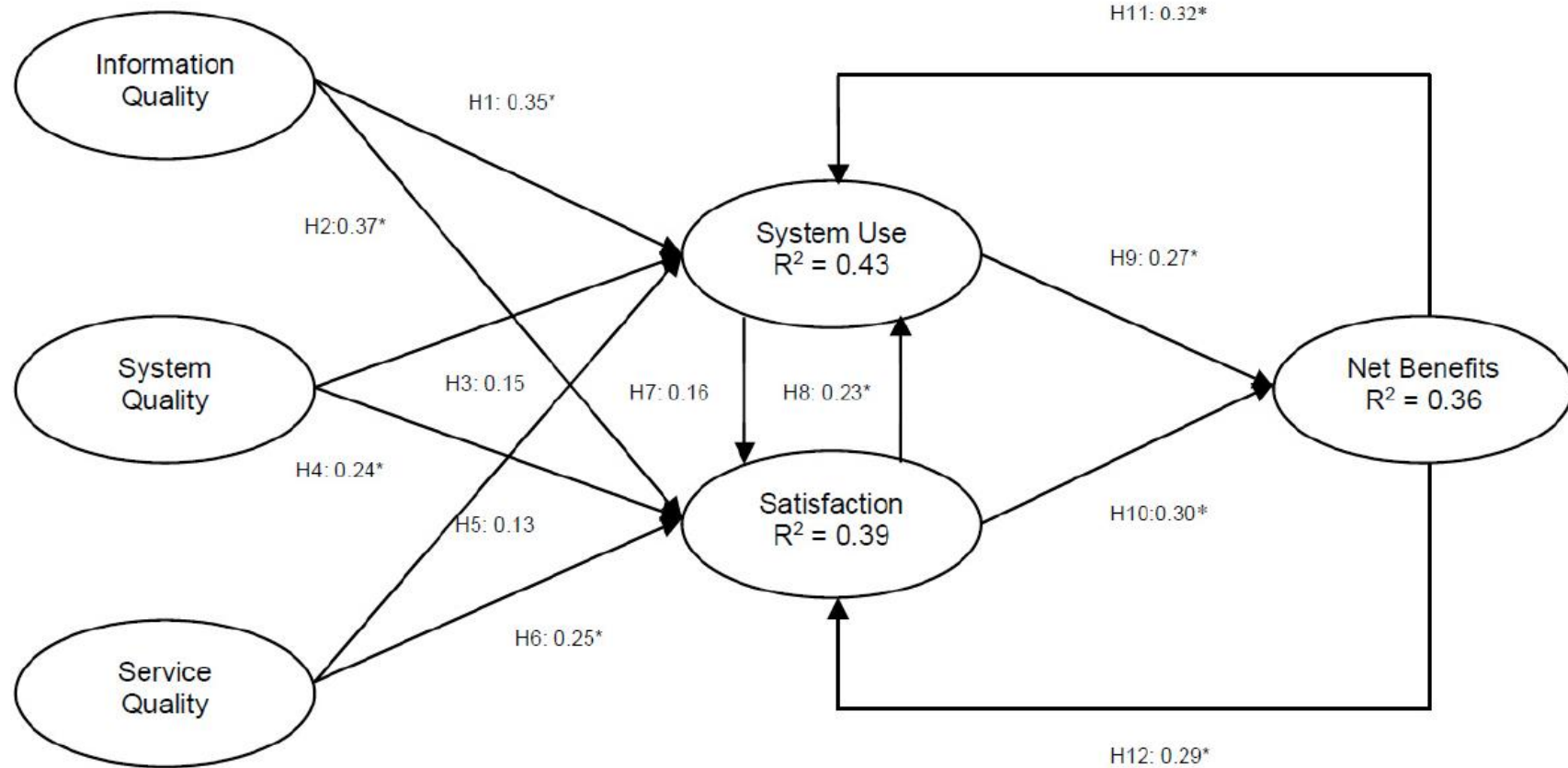
Green Information Systems

Green IS is a combination of hardware, software, communication devices, network, data resources, people, and agencies that processes (e.g., retrieve, store, transform, disseminate) data and information to facilitate planning, control, coordination, and decision making concerning sustainability issues (i.e., environmental, economic, and societal issues).

Research Model & Hypotheses



Survey Results



*P < 0.01

Data & Methods

- A particular IS (equipped with information- and communication-based technologies and a comprehensive information system) known as Regional Mesonet
- Measures adapted from literature
- Survey & Case study
- PLS (Partial Least Squares)

Preliminary Findings

- 9 of our 12 hypotheses are supported by the survey data
- Case study data are being analyzed (Nvivo, Text Analytics with SAS)

Project Schedule

- Completion of literature review and Proposition development: 30 September 2021
- Submission to a conference in 2021 after the development of propositions for soliciting feedback from reviewers
- Final interview questions and pilot study: 31 December 2021
- Data collection: 31 March 2022
- Write up of preliminary draft with results: 15 May 2022
- Submission to a journal: 15 October 2022

Questions?

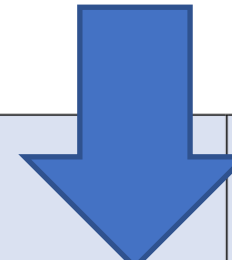
Thank you!

Please indicate the degree to which you agree or disagree with the following statements. (Please circle the appropriate number from 1 to 7. Here 1 signifies "strongly disagree" and 7 signifies "strongly agree")

1. Information generated by the regional mesonet (RM) information systems is up-to-date. 1 2 3 4 5 6 7
2. The regional mesonet (RM) information systems provide timely information. 1 2 3 4 5 6 7
3. Information generated by the regional mesonet (RM) information systems is understandable. 1 2 3 4 5 6 7
4. Information generated by the regional mesonet (RM) information systems is important. 1 2 3 4 5 6 7
5. Information generated by the regional mesonet (RM) information systems is concise. 1 2 3 4 5 6 7
6. Information generated by the regional mesonet (RM) information systems is relevant. 1 2 3 4 5 6 7
7. Information generated by the regional mesonet (RM) information systems is usable. 1 2 3 4 5 6 7
8. Information generated by the regional mesonet (RM) information systems is available. 1 2 3 4 5 6 7
9. The regional mesonet (RM) information systems are easy to use. 1 2 3 4 5 6 7
10. The regional mesonet (RM) information systems are easy to learn. 1 2 3 4 5 6 7
11. The regional mesonet (RM) information systems are reliable. 1 2 3 4 5 6 7
12. The regional mesonet (RM) information systems meet users' requirements. 1 2 3 4 5 6 7
13. The regional mesonet (RM) information systems have accurate data. 1 2 3 4 5 6 7
14. The regional mesonet (RM) information systems are flexible. 1 2 3 4 5 6 7
15. The regional mesonet (RM) information systems have good features. 1 2 3 4 5 6 7
16. The regional mesonet (RM) information systems allow data integration. 1 2 3 4 5 6 7
17. The regional mesonet (RM) information systems allow for customization. 1 2 3 4 5 6 7
18. A cross-functional team is crucial for project success. 1 2 3 4 5 6 7
19. Personnel of the regional mesonet (RM) information systems provide adequate technical support. 1 2 3 4 5 6 7
20. Personnel of the regional mesonet (RM) information systems are credible and trustworthy. 1 2 3 4 5 6 7
21. Personnel of the regional mesonet (RM) information systems give personal attention to my organization. 1 2 3 4 5 6 7
22. Personnel of the regional mesonet (RM) information systems are experienced and provide quality services. 1 2 3 4 5 6 7
23. Personnel of the regional mesonet (RM) information systems communicate well with my organization. 1 2 3 4 5 6 7
24. Personnel of the regional mesonet (RM) information systems are reliable. 1 2 3 4 5 6 7
25. Personnel of the regional mesonet (RM) information systems are responsive. 1 2 3 4 5 6 7
26. Personnel of the regional mesonet (RM) information systems are dependable. 1 2 3 4 5 6 7
27. My organization intends to use information from the regional mesonet (RM) information systems. 1 2 3 4 5 6 7
28. My organization is satisfied with the regional mesonet (RM) information systems. 1 2 3 4 5 6 7
29. My organization is satisfied with the information from the regional mesonet (RM) information systems. 1 2 3 4 5 6 7
30. My organization is satisfied with the service from the regional mesonet (RM) information systems. 1 2 3 4 5 6 7
31. I believe that the impact of the regional mesonet (RM) information systems on my organization has been positive. 1 2 3 4 5 6 7
32. I believe that regional mesonet (RM) information systems have contributed to reducing emissions of pollutants. 1 2 3 4 5 6 7
33. I believe that the regional mesonet (RM) information systems have contributed to increased natural resources utilization. 1 2 3 4 5 6 7
34. I believe that the regional mesonet (RM) information systems have contributed to state and local government agencies to create policies for enticing green energy investment and consumption. 1 2 3 4 5 6 7
35. I believe that the impact of the regional mesonet (RM) information systems on the society has been positive. 1 2 3 4 5 6 7
36. I believe that the impact of the regional mesonet (RM) information systems on environmental sustainability has been positive. 1 2 3 4 5 6 7

The following is an example of a risk analysis that accompanies a school's strategic plan.

**RISK ANALYSIS – HIGHLAWN SCHOOL OF BUSINESS
AUGUST 1, 2020**



Risk Description	Likelihood of Risk Occurring	Impact If the Risk Occurred	Severity (Based on Impact and Likelihood)	Mitigating Action(s)	Responsible Parties
Significant reduction in 2021-2022 freshman enrollment due to lingering effects of COVID-19	Medium	High	High	<ul style="list-style-type: none"> ▪ Schedule several additional virtual and de-densified, on-campus Open House Events ▪ Engage alumni in recruiting efforts (panel discussions, individual outreach) ▪ Increase personal interactions with prospective students (email and mailing campaigns) 	Undergraduate Admissions, University Advancement, Dean's Office
Expected retirement of several tenured faculty members over the next 3-5 years	High	Medium	High	<ul style="list-style-type: none"> ▪ Develop promising internal candidates (adjunct faculty) for tenure-track or full-time contract positions ▪ Obtain Provost's Office approval of 5-year hiring plan 	Dean's Office
Failure of Learning Management System and disruption of online and on-ground offerings	Low	Medium	Low	<ul style="list-style-type: none"> ▪ Maintain backup system with copies of course materials/resources ▪ Schedule and test regular updates to platform 	Department of IT
Govt. policy restrictions and continuing impacts of COVID-19 lead to reduction in graduate business international student enrollments ¹	High	Medium	Medium	<ul style="list-style-type: none"> ▪ Provide additional scholarship incentives for current undergraduate students who continue in graduate programs ▪ Increase opportunities for revenue generation through continuing education and certificate programs ▪ Increase advertising, promotion and recruiting efforts domestically 	Graduate Admissions, Dean's Office, Graduate Program Directors
Govt. restrictions and continuing impacts of COVID-19 lead to reduction in graduate business international student enrollments	75%	\$800,000	\$600,000	<ul style="list-style-type: none"> ▪ Provide additional scholarship incentives for current undergraduate students who continue in graduate programs ▪ Increase opportunities for revenue generation through continuing education and certificate programs 	Graduate Admissions, Dean's Office, Graduate Program Directors
Changing demographics in the region result in fewer future high school graduates and fewer entering freshmen	High	High	High	<ul style="list-style-type: none"> ▪ Increase promotion and recruiting efforts in more demographically favorable regions ▪ Explore opportunities for internal and external alliances to add attractive degree program options 	Undergraduate Admissions, University

Standard 1 & 9: Societal Impact and Engagement

- Societal impact refers to how a school makes a positive impact on the betterment of society, as identified in the school's mission and strategic plan. Societal impact can be at a local, regional, national, or international level.
- We need to describe the school's aspiration for societal impact and explicitly outline how we measure, or intend to measure, progress in this area.
- We need to develop a plan for the next accreditation cycle that will increase degree of impact.

Standard 1 & 9: Societal Impact and Engagement (cont.)

- GSB Societal Impact Aspiration Statement:
 - As a Catholic and Marianist business school, the GSB community will work to minimize economic disparity by providing access to resources and equal opportunities, and fostering programs that empower low-income residents and students in the West and Southwest regions of San Antonio.

Standard 1 & 9: Engagement and Societal Impact (cont.)

- Strategies:
 - Provide significant hardship grants to students from low income backgrounds in the West and Southwest regions of San Antonio.
 - Expand VITA program to include free, high quality financial literacy training for residents of the West and Southwest regions of San Antonio.
 - Provide access to start-up funds for entrepreneurs from economically disadvantaged backgrounds in the West and Southwest regions of San Antonio.
 - Offer free, high quality entrepreneurial training for residents of the West and Southwest regions of San Antonio.
 - Support technology needs to minimize the digital divide.
 - Partner with local organizations to amplify the economic impact on the West and Southwest regions of San Antonio.

U.N. Sustainable Development Goals Framework



Standard 1 & 9: Societal Impact and Engagement (cont.)

- Need to work on implementation plan to achieve Societal Impact Aspiration. Considerations include:
 - Verification process to determine hardship
 - How much funding to provide for grants and start-up funds
 - Identification of potential partner organizations
 - Promotion of resources to the West and Southwest regions
 - Set realistic target metrics in terms of:
 - Number of individuals trained, students receiving grants/scholarships, number of partner organizations, start-up funds provided
 - Range of faculty/staff/student involvement
 - Range of departments and/or centers involved
- Charge to: SMC due Spring '22.

Standard 2: Physical, Financial & Virtual Resources

- Alkek Upgrades
 - Ideas for collaborative space, experiential space, faculty space. Qualtrics survey sent - due 9/20
- Upgrading technology in the classroom
 - Reviewing budgets to move costs where possible to appropriate accounts e.g., personnel salaries
 - Free up general fund to purchase classroom tech
- Assessing faculty/staff tech needs
 - Review usage of databases and software
 - Sending out list of current databases and special software
 - Determine if it's a continued need and/or used sufficiently to justify ROI
 - Reallocate funds, where possible, to meet faculty/staff tech needs
- Charge to: Office of the Dean, ongoing

Standard 3: Faculty and Staff Resources

- Complete “Covid-19 Impact on Professional Development and Scholarship Statement”
 - All faculty and staff should include impact on AY 20-21, AY 21-22
- Statements should be no longer than a paragraph long and will be used as part of the addendum to the CIR report. The paragraph or bulleted points could highlight:
 - Developmental activities you could not attend (but normally do),
 - Slowed review process impacting acceptance of ICs, and/or
 - Presentations accepted but not given.
- Relevant to standards 3 and 8
- Helps provide context on scholarship productivity and professional development participation to the Peer Review Team.
- Due April 2022 with submission of GDP

COVID-19 Impact Statements (for AY 20-22)

- The rationale for this statement follows from the statement on the AACSB accreditation webpage related to Covid-19. I also felt it prudent to add other aspects of development (teaching, professional, leadership) that could likewise be negatively impacted.
 - *"AACSB understands that the COVID-19 health situation will impact the ability of a school to demonstrate a comprehensive research portfolio especially during a school's year of review as well as impacting a faculty member's ability to sustain their faculty classification. In preparing Table 2.1, schools should indicate the actual production of intellectual contributions. If the school chooses to do so, the school is welcome to produce a supplemental proforma table of what the production of intellectual contributions would have been if COVID-19 had not impacted the process. In regard to faculty qualifications, faculty should be classified based on their actual contributions. As with Table 2.1, a school may produce a supplemental proforma Table 15.1 reflecting faculty classifications adjusted for research and practice activities interrupted by the COVID-19 crisis."*

Standard 4: Curriculum

- Faculty currency assessed through course offerings and inspection of syllabi.
 - Does school offer courses in emerging topics: disruptive technologies, Cyber, design thinking, AI, or DA?
 - Traditional courses should be current; syllabi reviewed for currency and relevancy, e.g., assigned readings.
- PRT may review composition of faculty teaching forward-thinking courses to determine if they are FT or primarily supporting.
 - Core permanent faculty are charged with remaining current in their field.
- Introduction of a curriculum inventory (supports standard 7 too).
 - Example on next slide
- Charged to: Associate Dean Diaz

1 **GSB Curriculum Inventory**

2 **Faculty name:**

3
4 **Instuctions:**

5 **Course:** provide course number/title & whether the course is required or elective.

6 **Technology:** provide information on any form of technology that you currently use in your course(s). Do not include ordinary and usual software programs such as word processing or presentation software. Provide specific assignment examples, details, and explanation where needed.

7 **Positive societal impact:** societal impact can be at a local, regional, national, or international level. Possible examples are support of external communities, enhance the practice of business, address real-world problems, and improve society. Provide specific assignment examples, details, and explanation where needed.

8 **High impact practices:** examples include writing-Intensive courses, undergraduate research, collaborative assignments and projects that require team work, diversity/global-oriented learning practices where students are exposed to cultures, life experiences, and worldviews different from their own, service and community-based learning practices where students connect with community partners and local businesses as a required part of the course to apply what they are learning in real-world settings, capstone courses and projects, internships, and ePortfolios. Two additional examples that apply at the program/major level and can be addressed by department chairs are: i) common intellectual experience, which refer to core courses and themes such as technology or global interdependence; and ii) learning communities where students take two or more linked courses as a group and work closely with one another and with their professors to explore a common topic. Provide specific examples, details, and explanation where needed.

9 **Innovation:** is the technology or societal impact assignment(s) you are reporting on newly incorporated into the course or has it been offered in past versions of the course? A simple **Yes** - *for newly incorporated* and **No** - *for offered in past version of the course* is enough. Provide an explanation if needed.

10 **Diversity, equity, and inclusion (DEI):** do you feel adequately prepared to teach *diverse perspectives in an inclusive environment* ? Provide your response to the question at the bottom of the table. Elaborate your statement. Simple yes/no answer will not help us assess this item.

Course		Technology	Positive societal impact	High impact practices	Innovaton
Number & Title	R=Required/ E=Elective				Y = yes/N = no

Standard 5: Assurance of Learning (AoL)

- Need to document quality for stackable BI certificate
 - Charge to: AoL committee due 10/13 or 10/15
- Quality measures we can employ:
 - Show class structure and format are similar to other current MBA courses where formal AoL occurs.
 - Highlight the qualifications of faculty teaching the courses.
 - Work with ATS to review the four courses in the BI certificate.
 - Provide Canvas information to document best practices are being employed for online classes (e.g., Quality Matters).

Standard 7: Teaching Effectiveness

- Multi-measure for teaching effectiveness needed.
- Currently we use student evaluations only.
- Other options to consider:
 - GDP review (value-added portion plus feedback)
 - Chair observation or peer observation
 - Learning statements from professional teaching development conferences and workshops
 - What did you learn?, How did you incorporate it?
- Charge to: Faculty Affairs Committee (FAC)
 - Additional teaching effectiveness measure due 10/13 or 10/15

Standard 8: Impact of Scholarship

- The standard seeks to elevate impact of intellectual contributions over a simple count of, for example, peer reviewed journal articles, and we encourage schools to **incorporate a demonstration of impact into their assessments of quality of intellectual contributions** for all faculty.
 - The outcome sought from these intellectual contributions is to **impact the theory, practice, and/or teaching of business.**
 - Schools are also expected to **have a societal impact through their intellectual contributions and engagement in thought leadership with external non-academic stakeholders.**

Impact of Scholarship on Theory, Practice or Teaching

- Peer recognition of the originality, scope, and/or significance of intellectual contributions
- Editorial board recognition of the originality, scope, and/or significance of the work
- The applicability and benefits of the new knowledge to the theory, practice, and/or teaching of business
- Evidence of the influence of the intellectual contribution on professional practice, professional standards, legislative processes, and outcomes or public policy
- The usefulness and/or originality of new or different understandings, applications, and insights resulting from the creative work
- The breadth, value, and persistence of the use and impact of the creative work
- The originality and significance of the creative work to learning, including the depth and duration of usefulness
- Research awards and recognition (e.g., selection as a fellow of an academic society)

Impact of Scholarship on Society

- Contributions to major world issues, such as those identified by the U.N. Sustainable Development Goals
- Effects on business development
- Improved financial performance of organizations
- Contribution to business creation
- Improved health and safety outcomes
- Improvement in the brand and/or image of an organization, industry, or profession
- Examples of co-creation of knowledge with external stakeholders
- Examples of commercialization outcomes
- Examples of involvement in new venture creation
- Contributions through membership on boards and government bodies
- Examples of shaping community debate on issues of importance
- Examples of contributions to policy development for local, regional, national, or international public-sector organizations
- Outline of “pathways to impact” developed and the anticipated results from these

Impact of Scholarship on Society

- Projects initiated or leading with external non-academic stakeholders
 - Contract research or consultancy projects with private and public sector
 - Examples of changes to business practice arising from thought leadership engagement
 - Examples of public-sector policy changed or impacted by engagement with the school
-
- Charge to: Faculty Affairs Committee (FAC)
 - Additional scholarship impact measure due 11/10 or 11/12

Thought Leadership

- Thought leadership is evidenced when a business school is recognized as a *highly respected authority* in an area or areas of expertise, and is thus *sought after by relevant stakeholders*.
- Example:
 - A medium-sized business school in a comprehensive public university with undergraduate and postgraduate offerings (Americas)
 - *The school's thought leadership expertise, "innovation and entrepreneurship," aligns with the bent of the university as a whole. The focus is on creation and development of sustainable social and commercial small ventures and the associated pedagogy.*

Thought Leadership (cont.)

- Thought leadership can emanate from the scholarship produced by a school and/or its **engagement activities with external stakeholders.**
- Examples of engagement activities with external stakeholders:
 - organizing and holding regional, national, or international academic and/or practitioner conferences;
 - holding meetings for academic or professional organizations;
 - publishing working-paper series;
 - publishing academic journals;
 - establishing a case study clearinghouse; or
 - forming research relationships with private-sector, nonprofit, or government organizations.

Conduct Thought Leadership Analysis

- The school identifies its area(s) of thought leadership, **outlines its goals for these contributions, and describes its achievements over the last five years as well as plans for the next five years.**
- Charge: Associate Dean Diaz due 10/13 or 10/15

SUNY Plattsburgh Example

Dept.	Faculty	Discipline	Classification	Contributions Themes	Common Themes
SCIB					
	Kwangseek Choe	SCM	MKE	<ul style="list-style-type: none"> • Theory of Constraints (TOC) • Data Envelope Analysis (DEA) • Change management in academia • Transportation network • Graph theoretical methods • Finance, transportation, accounting, bankruptcy, • Supply chain risk analysis 	<ul style="list-style-type: none"> • Supply chain risk • Pedagogy, curriculum, academia • Finance • International • Small Business • Foreign direct investment
	Elie Chrysostome	IB	MGT	<ul style="list-style-type: none"> • International Entrepreneurship • Doing business in developing and emerging countries • Immigrant and diaspora entrepreneurship • Female entrepreneurship • Small business internationalization • Capacity building in developing and emerging countries • Strategic learning & trust within international alliances • Foreign direct investment 	

SBE Mission:

We provide our diverse learner population with an internationally recognized, high-value and AACSB accredited business education. We foster competencies for successful careers in the global economy, with a commitment to developing ethical and technologically proficient graduates. We emphasize teaching excellence and scholarship, complemented by experiential learning and exceptional mentoring, with impact on the regional and global community.

Theme	Total Faculty	% Faculty (30*)	# Classifications Spanned (7)	% Classifications	Mission Category Alignment
Teaching and Pedagogy	10	33%	MKE, MGT, MIS, FIN, ECO, ACC = 6	86%	EDU, ADV, CDP, EXP, IRC, IMP
International Trade and Business	10	33%	MGT, ECO, FIN, MKE, ACC = 5	71%	GLO, DIV, COM, IMP
Ethics & Social Responsibility	9	30%	MGT, ECO, FIN, MIS, ACC =5	71%	COM, GLO, IRC, IMP
Entrepreneurship & Small Business	9	30%	MGT, MKE, FIN, ECO = 4	57%	GLO, COM, DIV, IMP
Risk Analysis & Management	6	20%	MKE, MGT, MIS, FIN, ACC = 5	71%	GLO, IMP
Information Technologies and Security	5	17%	MKE, MIS, MGT, FIN = 4	57%	TEC, COM, EDU, IMP
Data Analytics & Decision Support	4	27%	MIS, FIN, ACC = 3	43%	TEC
Consumer Behavior	3	10%	MKE, MGT = 2	29%	DIV
Financial Reporting	3	10%	ACC = 1	14%	TEC

*note: total faculty number includes those that should be researching, but are not (1 faculty)

Common theme across departments:

- **Teaching and Pedagogy**
- **International Trade & Business (includes International Trade, International Business, Foreign Direct Investment, & Developing/Emerging Countries)**
- **Ethics & Social Responsibility (includes information privacy, Environment, Sustainability, & Corporate Social Responsibility)**
- **Entrepreneurship & Small Business (including Labor Economics)**
- **Risk Analysis & Management**
- **Information Technologies and Security**
- Data Analytics & Decision Support - pure research (denoted by **A** in last column)
- **Consumer Behavior**
- **Financial Reporting**

Create a Thought Leadership Statement

- SUNY Plattsburgh [example](#)
- Modify current Intellectual Contribution Statement:
 - As part of a teaching-focused institution committed to the Catholic and Marianist ideals of education, the Greehey School's faculty produce intellectual contributions that advance the teaching and practice of business and make a positive contribution to society. Consistent with our mission, we encourage teaching- and practice-focused activities and contributions, while also valuing discipline-based research.
- Charge: Associate Dean Diaz due 10/13 or 10/15

Address Concerns from Last PRT Visit

- **8.3 The school's portfolio of intellectual contributions contains exemplars of basic, applied, and/or pedagogical research that have had a positive societal impact, consistent with the school's mission.**
- The school's mission clearly emphasizes practice-focused research. There is likely some misclassification of categorization of research. **This may be due to individual faculty self-classifying their own work.** In regard to Standard 2, it is important that there is an alignment between the classifications, the actual research output, and the school's stated mission. **The school should begin to put into place a process to assure that intellectual contributions are appropriately classified. (Standard 2: Intellectual Contributions, Impact and Alignment with Mission)**

Greehey School of Business

Overall Faculty Research Self Categorization (current 5-year period)

Research Type	Overall Number	Overall Percentage
Basic or Discovery	30	26.3%
Applied or Integration/Application	62	54.4%
Teaching and Learning	22	19.3%
Total	114	100%

Summary of Action Items

- Finalizing alignment with the new standards:
 - Finalize risk management, update dashboard (standard 1)
 - Societal impact plan (standard 9)
 - Alkek funding and reallocation of funds (Standard 2)
 - Covid-19 impact statements (standard 3)
 - Completion of curriculum inventory (standard 4)
 - BI certificate quality assurance (standard 5)
 - Multi-measure of teaching effectiveness (Standard 7)
 - Assessment of impact of scholarship, thought leadership analysis and statement (standard 8)