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Managerial Attitudes towards Green Practices in Educational Restaurant Operations: An Importance-Performance Analysis

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ABSTRACT
This empirical study investigated educational restaurant operators' perspectives of green practices using importance-performance analysis. From the literature review, panel discussion, and a pilot study, a total of 32 green attributes in seven major categories were developed for the main survey. Based on 54 valid responses collected, the importance-performance analysis (IPA) was conducted. The results indicate that educational restaurants must keep up the good work of green practices in the pollution prevention category and improve green aspects in the category of water energy conservation. Detailed implications of green practices for restaurant operators are discussed.

KEYWORDS
Educational restaurant; green practices; important performance analysis (IPA)

Introduction

Today's restaurant operators and managers are confronted with several environmental issues, such as business ethics, social responsibilities, and sustainable economic success (Molina-Azorín, Claver-Cortés, López-Gamero, & Tarí, 2009). Strategic decisions in these environmental issues have become critical to success in their businesses because today's restaurant customers and even stakeholders expect restaurants to be socially responsible even if they sacrifice profit (Schubert, Kandampully, Solnet, & Krajlj, 2010). Increasing numbers of restaurant operators have recognized the demand for environmentally friendly operational practices and have put forth varying levels of efforts to meet the demand (Myung, McClaren, & Li, 2012). The restaurant industry is a significant consumer of fossil fuels, water, and other finite natural resources that present challenges to creating an environmentally sustainable future (Hu, Parsa, & Self, 2010). In addition, the restaurant industry is highly integrated with the global food system that includes the growing, harvesting, processing, packaging, distribution, consumption and disposal of food products. As a result, the restaurant industry is responsible for a significant amount of greenhouse gas emissions (Scheider et al., 2012). A significant portion of food systems in the United States is attributed to restaurants. The restaurant sector has a 51% share of the U.S. food dollar, with an estimated $863 billion of industry sales in 2019 (National Restaurant Association, 2019).

A number of studies have investigated the impact of hospitality operations on the environment. According to the authors' recent review of sustainability research in hospitality and tourism, there are two major research themes found in the restaurant industry: the influence of consumer behaviors on green restaurants (Atzori, Shapoval, & Murphy, 2018; DiPietro, Gregory, & Jackson, 2013; Hu et al., 2010; Jeong, Jang, Day, & Ha, 2014; Namkung & Jang, 2017; Sarmiento & El Hanandeh, 2018; Schubert et al., 2010) and the role of restaurant managers in green practices and pricing (Alonso & Ogle, 2010; Choi & Parsa, 2006; Raab, Baloglu, & Chen, 2018; Revell & Blackburn, 2007). A key finding from consumer behavior research on green restaurants was that customers valued environmentally responsible practices and were willing to patronize a green restaurant (Jeong et al., 2014). On the restaurant managers' side, Choi and Parsa (2006) investigated the relationship between restaurant managers' involvement in green practices and their willingness to increase prices. Others also proved that management efforts in energy efficiency and waste minimization can reduce overall operating costs (Alonso & Ogle, 2010; Revell & Blackburn, 2007). Even though more sustainability studies in the restaurant sector have emerged in recent years, it is still rare to find sustainability research investigating restaurant managers' and/or operators' perceptions of green practices. To the authors' knowledge, in particular, there has been no empirical

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sustainability research targeting educational restaurants that are operated by hospitality institutions.

The environmental impact of colleges and universities that provide college/university dining operations, including educational restaurant(s) for their students, is also significant. Chen, Arendt, and Gregoire (2010) investigated sustainable practices in college and university dining services. They focused on recycling materials such as fats, oils, grease, cardboard, aluminum, etc., and products such as napkins. Also, Chen, Gregoire, Arendt, and Shelley (2011) found that subjective norm, which is the influence of social pressures on individuals to perform a particular behavior or not, had the most impact on college and university dining services administrators' intention to adopt sustainable practices. More hospitality programs in higher education have identified an obligation to protect the environment as one of their core values, and have integrated sustainability into their strategic plan (Scheider et al., 2012). Program administrators, faculty, and staff are aware of the need for hospitality laboratories to address their impact on the environment and to assess the sustainability of their hospitality laboratories. Therefore, today's educational restaurants, operated by hospitality programs, can offer an opportunity to mentor students in restaurant industry practices which limit environmental impacts, as well as, provide students with unique academic experiences that are practical and relevant (Scheider et al., 2012). However, the dearth of research investigating the sustainable practices and strategies implemented by hospitality management institutions and their on-campus laboratories, such as learning restaurants, hotels, and conference centers, etc., is noteworthy. Therefore, the main purpose of this empirical research was to examine managers' and/or operators' perspectives of current green practices at educational restaurants. Specific objectives of this study included:

(1) Identifying what kind of green attributes were most commonly applied at educational restaurants,
(2) Exploring the importance of each green attribute from the perspective of educational restaurant operators,
(3) Investigating the actual performance of green attributes at educational restaurants.

In this empirical research, the research focus was narrowed to green practices at educational restaurants operated by 2-year or 4-year hospitality programs. The assessment of sustainability practices at educational restaurants in such programs can be a valuable instrument to aide researchers, program administrators, faculty, staff, and students in determining where hospitality programs have been successful in their sustainability efforts and in elucidating new ways in which they can limit their impact on the environment.

Literature Review

Sustainability Research in Hospitality Management

Sustainability as a part of corporate social responsibility (CSR) has played an important role in the long-term success of business (Dutta, Umashankar, Choi, & Parsa, 2008; Lee, Singal, & Kang, 2013). It is important for organizations to realize that they need to serve not only customers who patronize their businesses but also the community because organizations in the hospitality and tourism industry are able to benefit from CSR activities. Numerous studies have shown the improvements such as creating competitiveness (Kim, Thapa, & Holland, 2018), increasing financial performances (Joyner & Payne, 2002; Lee, Singal, et al., 2013), and positive impacts on service evaluations (Ye, Cronin, & Peloza, 2015). For these effects, many large restaurants companies such as Chipotle, Starbucks, etc., have promoted via CSR reports and websites their interest in sustainability and what they have been doing for the environment (Chipotle, 2018; Starbucks, 2019). Therefore, consumers and stakeholders expect businesses to be socially responsible even if they sacrifice their profits (Schubert et al., 2010).

Sustainability can be linked to many forms, hospitality and tourism activities, and environments. In the hospitality and tourism industry, the concept of sustainability has been a major focus in the debate on environmentally integrated tourism and hospitality development. A substantial amount of research, particularly in the tourism field, has enhanced the understanding of the highly complex and intertwined issues of sustainability, such as quality of life, equity, and the environment (Farrell & Twining-Ward, 2004). It is not surprising that the trends of sustainability research closely reflect broader trends in general tourism research, particularly environmental destination marketing perspectives (Lu & Nepal, 2009). For example, Fjelstul (2014) claimed that the marketing of sustainable attributes can enhance destination competitiveness. The aims and components of sustainable tourism development are to influence tourists' motivation to choose the destination and improve tourists' satisfaction via a more meaningful, enjoyable, and memorable experience (Agapito, Valle, & Mendes, 2014; Malone, McCabe, & Smith, 2014; Pine & Gilmore, 2014).

In the context of hospitality, the topic of sustainability has only recently attracted the attention of researchers. The bulk of empirical hospitality research on sustainability examined the relationship between the sustainability

strategies or practices hospitality firms adopt and firm performance through customer satisfaction and behavioral intentions (Cvelbar & Dwyer, 2013; DiPietro et al., 2013; Xu & Gursoy, 2015).

According to the authors' content analysis of 138 sustainability articles published in various hospitality and tourism journals since 2000, there are three major themes found in sustainability research in hospitality and tourism: stakeholders' perceptions of sustainability, awareness of sustainability practices, and green technology and benchmarking (See Table 1). As presented in Table 1, the most popular sustainability topic in hospitality and tourism research is the examination of perceptions of sustainability from different stakeholders' perspectives: customers, managers/operators, the community, and employees. While most sustainability research in tourism focuses on resident perceptions of sustainability for tourism development, most research in hospitality examined customer attitude and behavior toward sustainability in hospitality operations, particularly in hotel operations.

As today's customers become more responsive to the environmental impact of hospitality and tourism development, numerous studies have explored customer attitude and behaviors toward sustainability and green practices in the hospitality industry. In the lodging industry, many previous researches identified that the greening of the lodging industry is one of the important factors when customers select their hotel to stay (Chen & Tung, 2014; Han, Hsu, & Lee, 2009; Lee, Hsu, Han, & Kim, 2010; Manaktola & Jauhari, 2007; Verma & Chandra, 2016, 2018). Manaktola and Jauhari (2007) found that hotel customers in India not only consider green practices important but they are willing to stay in the same hotel without any compromise of the service quality. Lee et al. (2010) identified that green hotel image can become an effective marketing tool in attracting and retaining customers. Also, Han et al. (2009) confirmed that hotel customers who held positive attitudes toward eco-friendly practices were willing to not only patronize the hotel more but also to spread positive word of mouth about the hotel. In addition, Verma and Chandra (2018) identified that green practices are one of the most important factors when customers make a decision to choose a hotel. Also, the key sustainable practices related to hotel industry are energy conservation, recycling, and greenscaping.

In the restaurant setting, Hu et al. (2010) found that customer environmental concerns can positively affect their intentions to patronize a green restaurant. According to King (2012), a sustainable restaurant menu (such as organic and locally grown produce, meat, and fish) can be an essential factor to build up a green brand image. Namkung and Jang (2017) found that more than two-third of respondents were willing to pay extra money for green restaurant practices. By and large, many empirical studies examining customer attitude and behavior toward sustainability have been limited to the testing of theories that use sample educational hospitality organizations.

Managers' attitudes toward sustainability affect hospitality firms' environmental management. Commitment to sustainability is regarded as a competitive advantage in the hospitality business, eventually leading to long-term success. In addition, sustainability-oriented hospitality managers and operators expect the following benefits of pro-environmental practices: 1) better relationships with the public and the local community, 2) financial rewards, and 3) more market share (Kirk, 1998). An empirical study found that customers are willing to pay a premium price for green hospitality operations (Choi & Parsa, 2006).

Table 1. Themes of sustainability research in hospitality.

Major Themes	Sub-Themes	Publications
Stakeholders' Perceptions of Sustainability	*Customers' Perceptions*	Atzori et al. (2018); DiPietro et al. (2013); Dutta et al. (2008); Han et al. (2009); Hu et al. (2010); Jang et al. (2011); Jeong et al. (2014); Lee et al. (2010); Namkung and Jang (2017); Raab et al. (2018); Sarmiento and El Hanandeh (2018)
	Operators' Perceptions	Ali, Murphy, and Nadkarni (2018); Bohdanowicz, Zientara, & Novotna (2011); Choi and Parsa (2006); Kasim (2009); Kim et al. (2018); Lee et al. (2016)
	Community Perceptions	Choi and Murray (2010); Lee (2012); Poitras and Getz (2006); Vincent and Thompson (2002); Zouganeli, Trihas, Antonaki, and Kladou (2012)
Awareness of Green Practices	*Policy & Governance*	Bramwell (2011); Chan, Wong, and Lo (2009); Chen et al. (2011); Farsari, Butler, and Szivas (2011); Hall (2011); Soteriou and Coccossis (2010)
	Green Marketing	Chhabra (2009); Green, Zelbst, Meacham, and Bhadauria (2012); Ham and Lee (2011); Hu (2012); Lee et al. (2016); Lee, Singal, et al. (2013)
	Green Tourism	Landorf (2009); Mair and Jago (2010); Miller, Rathouse, Scarles, Holmes, and Tribe (2010); Park and Boo (2010); Weaver (2012)
	Green Initiatives	Butler (2008); Chou, Chen, and Wang (2012); Moeller, Dolnicar, and Leisch (2011); Singjai, Winata, and Kummer (2018); Smerecnik and Andersen (2011)
Green Technology & Benchmark	*Environmental Management System*	Chan and Hawkins (2010); Chan and Hawkins (2012); Chung and Parker (2008); Jose, Enrique, Jorge, and Jose (2010)
	Evaluation of Sustainability	Blanco, Rey-Maquieira, and Lozano (2009); Jarvis, Weeden, and Simcock (2010); Cernat and Gourdon (2012); Zhang, Joglekar, and Verma (2012)
Review of Sustainability Research	*Critical Review*	Chamorro, Rubio, and Miranda (2009); Buckley (2012); Lu and Nepal (2009); Myung et al. (2012)

Barber (2014) found that environmental marketing targeted to green consumer segments is more likely to be effective than green marketing targeted to the entire population. Other sustainability studies focusing on hospitality managers or operators indicated that the size of operation affects their attitude toward sustainable hospitality operations (Huimin & Ryan, 2011; Kasim, 2009; Kirk, 1998). Managers from larger hotel corporations have more positive attitudes toward sustainability management since they have more resources (Kasim, 2009; Kirk, 1998). However, small and medium-size hotels still have difficulties in adopting environmental management due to the lack of pressure from stakeholders (Kasim, 2009). Without external pressure, it is hard for managers from small and medium hotels to get involved in sustainability activities mainly because they are too busy with normal business activities and they lack the knowledge about the marketability of environmental management (Kasim, 2009).

Sustainability Research in the Restaurant Industry

Unlike the tourism industry, in which the natural environment is a key attraction to tourists, the restaurant industry is less dependent on the surrounding natural environment. As a result, fewer studies have been conducted about environmental issues within the restaurant industry. According to the content analysis of sustainability research (Myung et al., 2012), in which a total of 58 sustainability articles published in 25 hospitality and tourism journals since 2000 were content-analyzed, the restaurant sector (10%) has attracted less attention from hospitality researchers, compared with the lodging sector (83%). However, environmental issues in the restaurant industry, green marketing in particular, have drawn increased attention from hospitality researchers in recent years. The increased research attention on sustainability in the restaurant sector can be explained in light of emerging environmental rules and regulations and the increased demand for environmentally friendly food from customers (Jang, Kim, & Bonn, 2011).

New environmental rules set by the government and associations have increased consumers' environmental awareness. As a result, consumers prefer choosing eco-friendly products and companies. Also, environmental rules and regulations require companies to meet standards that help minimize negative environmental effects (Jang et al., 2011). Accordingly, restaurant companies began implementing green practices to their restaurant operations in order to contribute to the social and natural environments. Another primary motive for a sustainable restaurant operation is the marketing potential of green initiatives (Choi & Parsa, 2006). Sustainable operations help restaurant operators build a positive public image that attracts environmentally conscious customers. (Jeong et al., 2014; Namkung & Jang, 2017)

According to an empirical study about customer behavior and intention to purchase green products, consumer purchasing intention is affected more by environmental, community and ethical dimensions, rather than price and quality (Doszhanov & Ahmad, 2015; Handelman & Arnold, 1999). In the restaurant industry, more than 63% of consumers prefer spending more money to buy organic food or locally sourced food. Also, a previous empirical study (Speer, 1997) revealed that consumers are willing to pay a premium price for environmentally friendly products of extra 5%. Similarly, Vieregge, Scanlon, and Huss (2007) found that more than 67% of customers preferred green restaurants and 10% of respondents were willing to accept higher prices for green restaurants. In addition, over 80% of The Americans consider themselves to be environmentally conscious and drive the $11 billion organic food industry (Green Restaurant Association, 2015). Sarmiento and El Hanandeh (2018) found that 78% of the customers are willing to pay more for their meals in a green restaurant and willingness to pay for green service is small with high price elasticity of demand.

Green operation can be an effective marketing strategy for restaurants. Hu et al. (2010) suggested that consumer knowledge of sustainable restaurant practices positively affected consumer intention to patronize a green restaurant. The results of their study also indicated that restaurants could take advantage of green products and green operations to attract environmentally conscious customers. They suggested that green restaurants aggressively inform their target customers of their involvement in and commitment to sustainable practices. Hu et al. (2010) investigated the moderating role of demographic profiles on customer intention to patronize green restaurants. Their findings indicated that customers who are above 41 years of age have higher intentions to patronize a green restaurant than younger customers. In addition, people who have a higher level of education have higher intentions to visit a green restaurant than people who have a lower educational level. Schubert et al. (2010) found that more restaurant customers considered dining at green restaurants. Therefore, they suggested that green restaurants market themselves with green practices as a competitive edge. Also, Choi and Parsa (2006) revealed that restaurants using green practices could improve their relationships with both customers and community.

Green Practices in the Restaurant Industry

Green restaurants are defined as new or renovated structures designed, constructed, operated, and demolished in an environmentally friendly and energy-efficient manner

(Lorenzini, 1994). LaVecchia (2008) and Jang et al. (2011) define green restaurants as locations that offer green menu items that are locally sourced and certified organic as well as specific green initiative practices such as recycling, energy and water conservation, and waste reduction. Simply put, they are restaurants that actively engage in green practices (Schubert et al., 2010). The broad categories of green practices can include 1) developing energy and natural resources conservative production process, 2) creating advertisements and conveying messages about a company's commitment to being environmentally conscious, 3) setting prices for green products that balance the consumers' willingness to pay a price premium for green practices, and 4) conserving resources in transportation of products (Dutta et al., 2008). Green restaurants implement these green practices in their daily operations.

As eating out has become a common habit for Americans, the number of restaurants existing in the United States has substantially increased, which facilitates the consumption of the environment for the restaurant industry (Schubert et al., 2010; U.S. Bureau of Labor Statistics, 2017). Obviously, the restaurant industry is a huge consumer of natural resources and thus has a great impact on the environment. Major environmental problems related to the restaurant industry include solid waste, water consumption, energy consumption, and air pollution (Butler, 2008; Carbonara, 2007; Johnson, 2009). Later, Hu et al. (2010) added assurance of food safety and the use of chlorofluorocarbons in refrigeration to the list of environmental problems in the restaurant industry. In addition, energy waste from transportation and storage is another environmental issue for restaurants that do not use locally raised food (Schubert et al., 2010). Much research on green restaurant operations has addressed environmental issues by examining various green practices adopted in today's restaurant operations.

Using three dimensions of green practices (green action, green food, and green donation), Schubert et al. (2010) examined restaurant customers' perceptions of green practices. Their empirical study found that of the three dimensions of green practices, green action (energy and water efficiency, recycling, green construction, etc.) is most valued by customers, followed by green foods (organic and locally raised foods) and green donation (engaging with green projects). Choi and Parsa (2006) developed a conceptual framework for green practices in the restaurant industry through the literature review. They classified green practices in restaurant operations into three categories: health concerns, environmental concerns, and social concerns. Their empirical study revealed that restaurant managers/operators are more concerned about social and environmental practices. Similarly, Hu et al. (2010) classified green restaurant practices into three different categories: environmental concerns, ecological behaviors, and knowledge of green restaurants. Dutta et al. (2008) proved that American restaurant customers are more involved in environmentally and socially responsible practices, while Indian customers are more concerned about health-related practices.

A paucity of sustainability research on green practices in college and university educational restaurants can be found in academic journals. A few studies examined perspectives of sustainability in hospitality management curriculum (Barber, Deale, & Goodman, 2011; Millar & Park, 2013) and the green culinary behaviors of hospitality college students (Chen et al., 2010; Wang, 2016). According to Chen et al.'s study, the commonly applied green practices in educational restaurants are recycling programs, use of permanent ware and refillable mugs, and use of recycled products. Their study also revealed that the least common green practices are composting, using fewer styrofoam cups, and serving locally grown foods.

Methodology

Target Subjects

The target subjects of this study were educational restaurant managers and/or operators in the United States. An intensive online search was conducted to identify potential participants for this study. Cluster sampling was employed by type of institution, program of study, and geographical area. Post-secondary, degree-granting institutions were grouped into six categories; two-year public, two-year private, two-year for profit, four-year public, four-year private, and four-year for profit. The programs of study at these institutions were further divided into culinary arts and hospitality. A state-by-state search was conducted for organizational purposes. Information gathered included institutional information, program type, program name, and contact information for the immediate instructor or department head. As a result of this extensive search, a total of 207 target subjects from 197 educational restaurant facilities across the nation were identified for the main survey.

Measurement Development & Survey Design

Green restaurant practices employed in this study were selected through a series of steps. Since there was no appropriate previous literature with which to form a foundational base, the first step was to identify sample green attributes from several trade publications. In the second step, initial measurements for this study were

developed based on previous research in green restaurant operations (Hu et al., 2010; Jang et al., 2011; Manaktola & Jauhari, 2007; Vieregge et al., 2007). In the third step, a panel discussion comprised of five experts in green restaurant operations was held to select the viable green practices for this study. Substantial modifications were made with input gathered from the panel discussion, mainly deleting several green attributes from the initial set of green attributes. The panels also classified the chosen green attributes into seven major categories: 1) Energy Conservation-Water-Kitchen, 2) Energy Conservation-Water-Dining and Common Areas, 3) Energy Conservation-Electricity-Kitchen, 4) Energy Conservation-Electricity-Dining and Common Areas, 5) Energy Conservation-Natural Gas/Solar power-Kitchen, 6) Material Recycling, and 7) Pollution Prevention. Finally, the green attributes chosen through the panel discussion were fine-tuned through the pilot study with 15 educational restaurant managers/operators. After deleting two additional green attributes following administration of the pilot study, the final set of 32 green attributes in 7 categories were chosen for the main online survey (See Table 3).

The online survey comprised three sections. The first section asked target subjects to rate the importance of 32 green attributes using a 5-point Likert scale. Using the same 32 green attributes, target subjects were asked again to rate the performance of each green attribute at their educational restaurant using a 5-point Likert scale. In the last section, the survey concluded with demographic questions.

Data Collection

An invitation and two reminder emails, which contained a brief introduction of this research and a link to the online survey, were sent to all target subjects through the online survey tool, Qualtrics. Of the original list of 207 target subjects, 30 contacts were further deleted immediately after the invitation email was returned to the researchers mainly because of the failure of email delivery, thus reducing the total sample size to 177. Of the 177 target subjects, a total of 58 responses were collected after two additional reminder emails. After deleting four more responses due to the incompleteness of the survey, 54 responses were finally chosen for data analysis, resulting in a usable response rate of 31%.

Importance-Performance Analysis

The collected data were analyzed using importance-performance analysis (IPA). The IPA was an effective analytical tool for this study because it allowed identification of key green practices representing critical issues of importance for educational restaurant managers and operators. It also helped address other research question of this study, namely, the actual performance of those green practices at educational restaurants. Lastly, the perceptual map of IPA presented the relative positioning of each green practice and stressed where educational restaurant managers/operators or hospitality program administrator should focus.

The results of the IPA were displayed on a two-dimensional grid, named importance-performance matrix or IPA grid. The IPA Grid is divided into four quadrants by the mean scores for importance and performance. As shown in Figure 1 in the results section, green attributes located in Quadrant I (Keep up the Good Work) were ranked high in importance and performance. For these green attributes, educational restaurant managers/operators should try to maintain their good work. Green attributes in Quadrant II (Possible Overkill) were rated high in performance, but low in importance. Since green attributes in this quadrant are absorbing substantial operating resources without positive influence on performance, the educational restaurant management should reallocate the resources to improve other important green attributes. Green attributes located in Quadrant III (Low Priority) were low both in importance and performance. These green attributes deserve the least attention from restaurant managers/operators. Finally, Quadrant IV (Concentrate Here) is where green attributes were rated with a high level of importance, but a low level of performance. This is an area that requires the most attention and efforts from green restaurant operators. Also, green attributes in this quadrant provide green restaurant operators with an opportunity to improve overall green strategy.

Results

Demographic Profile of the Respondents

The demographic characteristics of 54 respondents were identified through the frequency and descriptive analyses (see Table 2). A majority of respondents were male (57%) between 40 and 49 years of age. More than half of respondents had either a master's degree (32%) or a doctoral degree (31%). This high education level of respondents was understandable because most respondents, educational restaurant managers/operators, were also instructors in different restaurant operations courses. The majority of restaurants they managed were fine-dining restaurants (43%), with a la carte service (70%). Hospitality students were involved in the management at most educational restaurants (59%). Since the main goal of educational restaurants is to allow students to practice, discover, and learn

Table 2. Demographic profile of respondents.

Demographic Variable	*n* (%)
Gender (*N* = 54)	
Male	31 (57)
Female	23 (43)
Age (*N* = 54)	
30s	8 (14)
40s	27 (50)
50s	10 (18)
60s+	9 (17)
Degree (*N* = 54)	
High school	2 (5)
2-year college diploma	5 (9)
Bachelor degree	12 (23)
Master degree	18 (32)
Doctoral degree	17 (31)
Restaurant type (*N* = 54)	
Cafeteria	10 (19)
Casual	21 (38)
Fine-dining	23 (43)
Serve Type (*N* = 54)	
A la carter	38 (70)
Buffet	9 (17)
Take out	7 (13)
Student managed? (*N* = 54)	
Yes	32 (59)
No	22 (41)
Your institution? (*N* = 54)	
2-year public	27 (50)
2-year non-profit private	7 (13)
2-year proprietary	1 (0)
4-year public	14 (26)
4-year non-public	3 (5)
4-year proprietary	2 (4)
Financial relationship? (*N* = 54)	
Fiscally supported	13 (24)
Revenue neutral/self sufficient	18 (33)
Revenue generating	23 (43)
Who is responsible for purchasing? (*N* = 54)	
Instructor	24 (45)
Student	0 (0)
Student manager	5 (9)
Purchasing agent	23 (45)
Location (*N* = 54)	
Rural	16 (29)
Suburban	26 (48)
Urban	12 (22)
Regional location (*N* = 54)	
Alaska/pacific	5 (10)
Northeast	6 (11)
Midwest	6 (11)
Northwest	10 (19)
Southeast	7 (13)
Southwest	18 (33)
Other	2 (4)
Mandate recycling? (*N* = 54)	
Yes	39 (73)
No	15 (27)

by doing, this trend of getting students involved in restaurant management is convincingly understandable. As for the type of institution in which the education restaurant was operated, half of the respondents were from 2-year public institutions (50%), followed by 4-year public institutions (26%) and 2-year non-profit private institutions (13%). The majority of educational restaurants were revenue-generating restaurants (43%) and located in suburban area (48%). For geographic location of those restaurants, the most U.S. educational restaurants were found in the Southwest (33%), followed by the Northwest (19%) and the Southeast (13%). The last question included in the demographic section was whether or not recycling was mandated at respondents' educational restaurants. The results show that recycling was mandated at 73% of those restaurants.

Perceived Importance of Green Practices

The means of perceived importance of green practices were calculated as shown in Table 3. When category means of perceived importance of green practices were compared, green practices in energy conservation-electricity-kitchen (M = 4.40) were rated as the most important green practices, followed by pollution prevention (4.37), energy conservation-electricity-dining and common area (4.28), and material recycling (4.10). These four-category means were higher than the overall importance mean (4.05). On the other hand, relatively less important green categories included energy conservation-water-kitchen (3.78), energy conservation-natural gas-kitchen (3.77) and energy conservation-water-dining and common area (3.64).

Out of a total of 32 green attributes, 20 green attributes had a mean importance score higher than 4, meaning educational restaurant managers/operators ranked those 20 green attributes between "*important*" and "*extremely important*". The top five most important green attributes included 1) properly maintained grease traps (4.70), 2) properly maintained kitchen hood ventilation system (4.68), 3) ongoing maintenance and timely repair of refrigeration unit seals, gaskets, coils (4.65), 4) in-house recycling protocols for food waste (composting), glass, metal, plastic, paper, cardboard (4.61), and 5) properly cleaned and maintain dock areas (4.55). Three of the five top-ranked green attributes were in the category of pollution prevention. On the other hand, the green attributes that ranked the least important were 1) service of drinking water to quests only upon request (3.16) and 2) restaurant furnishings made of recycled materials (3.35). Notably, 5 out of 6 green attributes in the category of energy conservation-water-kitchen were rated below the overall importance average (4.05), ranging from 3.52 to 3.85.

Perceived Performance of Green Practices

The means of perceived performance of green attributes were also calculated using descriptive statistics (See Table 3). The overall performance mean (3.43) of green attributes was substantially lower than overall importance mean of green attributes (4.05), indicating that the current green performances at educational restaurants failed to match or exceed the green expectations from educational restaurant managers/operators. Category means of perceived performance of green practices were compared to identify which area was ranked high or low. Results in Table 3 indicated that green

Table 3. Means of perceive importance and performance of green practices.

Attribute	Importance (n = 54)	Performance (n = 54)
Energy Conservation-Water-Kitchen		
A. Monitor billing for indications of possible problems.	3.65	3.02
B. Timely repair of leaks in kitchen equipment and plumbing.	4.31	3.36
C. Low flow/manually triggered rinse nozzles in the dish station.	3.52	3.29
D. Pressure regulated/properly calibrated low flow dish machines and steamer units.	3.59	3.52
E. Thaw procedures that do not depend on running water.	3.85	3.18
F. Manual dish washing procedures that limit free running rinse water.	3.74	3.68
	*CM:3.78	CM: 3.34
Energy Conservation-Water-Dining and Common Area		
G. Low flow/high efficiency toilets and faucets.	3.88	2.98
H. Service of drinking water to quests only upon request.	3.16	3.76
I. Posted signage in common areas encouraging water conservation.	3.52	2.90
J. Low flow/metered watering systems for interior and exterior landscaping.	3.99	3.48
	CM: 3.64	CM: 3.28
Energy Conservation-Electricity-Kitchen		
K. Energy efficient lighting in preparation areas, hoods, refrigerators.	4.25	3.55
L. Energy efficient kitchen equipment such as ovens, holding boxes, steam tables, walk-in and reach-in refrigeration units, ice machine.	4.29	3.23
M. On-going maintenance and timely repair of refrigeration unit seals, gaskets, coils.	4.65	3.41
	CM: 4.40	CM: 3.40
Energy Conservation-Electricity-Dining and Common Area		
N. Automatic thermostats programmed for optimal temperature at different times of day or day of week.	4.39	3.57
O. Energy efficient lighting in dining room, bar, restroom, lobby and outside areas.	4.35	3.24
P. Motion sensors to regulate lighting.	4.09	3.33
	CM: 4.28	CM: 3.38
Energy Conservation-Natural Gas/Solar Power-Kitchen		
Q. Energy efficient gas powered equipment such as range tops, stoves, kettles, water heaters.	4.13	3.24
R. Established solar powered equipment such as water heaters.	3.61	2.67
S. Experimental solar/wind (other) power as a replacement for standard energy sources.	3.57	2.70
	CM: 3.77	CM: 2.87
Material Recycling		
T. Purchasing products packaged in recyclable, returnable, reusable containers.	4.26	3.91
U. Purchasing from reputable vendors with recycling protocols practiced at the source.	4.04	3.95
V. In-house recycling protocols for food waste (composting), glass, metal, plastic, paper, cardboard.	4.61	3.82
W. Take out packaging products that are compostable, Biodegradable.	4.35	3.77
X. Established relationships with third party charity feeders for utilization of unused or overproduced food items.	4.01	3.33
Y. Restaurant furnishings made of recycled materials.	3.35	3.16
	CM: 4.10	CM: 3.66
Pollution Prevention		
Z. Environment friendly kitchen cleaning products for dishes, counter tops, floors.	4.09	3.67
Za. Environment friendly dining room and common area cleaning products for linens, tables, bar tops.	4.13	3.71
Zb. Dedicated waste water disposal to keep pollutants from entering storm drains.	4.13	3.48
Zc. Properly maintained grease traps.	4.70	3.86
Zd. Properly maintained kitchen hood ventilation system.	4.68	3.91
Ze. Properly cleaned and maintain dock areas.	4.55	3.95
Zf. Environment friendly fertilizers used in interior and exterior landscaping.	4.26	3.29
	CM: 4.37	CM: 3.70
	**OM: 4.05	OM: 3.43

Scale for Importance: 1 = Not at all Important, 2 = Unimportant, 3 = Neither Important nor Unimportant, 4 = Important, 5 = Extremely Important. Scale for Performance: 1 = Very Dissatisfied, 2 = Dissatisfied, 3 = Neutral, 4 = Satisfied, 5 = Very Satisfied. *CM = Category Mean, **OM = Overall Mean.

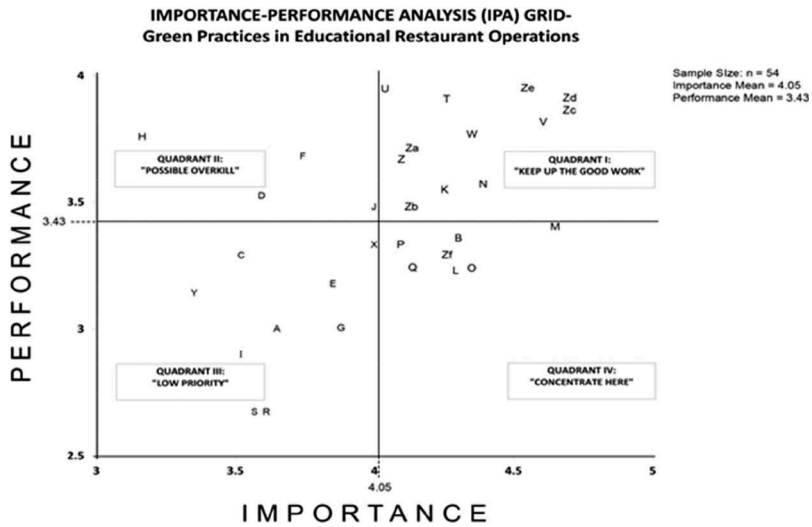

Figure 1. IPA grid – green practices in educational restaurant operations.

attributes in the category of pollution prevention (3.70) performed the best, followed by material recycling (3.66). On the other hand, the green category that was perceived to be least performed was energy conservation-natural gas-kitchen (2.87). In comparison with category means of perceived importance of green attributes, no category mean of perceived performance surpassed its counterpart, the category mean of perceived importance.

For individual green attributes, the top five best performed green attributes were 1) purchasing from reputable vendors with recycling protocols practiced at the source (3.95), 2) properly cleaned and maintain dock areas (3.95), 3) properly maintained kitchen hood ventilation system (3.91), 4) purchasing products packaged in recyclable, returnable, reusable containers (3.91), and 5) properly maintained grease traps (3.86). The most well-performed green attributes were found in either the pollution prevention or the material recycling areas. On the other hand, the least performed green attributes were 1) establish solar-powered equipment such as range tops, stoves, kettles, and water heaters (2.67) and 2) experimental solar/wind power as a replacement for standard energy sources (2.70). These results indicated that solar/wind power had not yet replaced any standard energy sources at educational restaurant facilities.

Importance-Performance Analysis (IPA) Grid

Importance and performance means of each green attribute were plotted in the Importance-Performance Analysis Grid (IPA Grid). The overall means for importance (4.05) and performance (3.43) were used for the placement of axes on the grid. As shown in Figure 1, the four quadrants were labeled as "Keep Up the Good Work (Quadrant I)," "Possible Overkill (Quadrant II)," "Low Priority (Quadrant III)," and "Concentrate Here (Quadrant IV)."

Twelve green attributes fell into Quadrant I, "Keep Up the Good Work." Six out of seven green attributes in pollution prevention category were located in this quadrant, meaning polluting prevention was perceived as an important green area by educational restaurant managers/operators and their educational restaurants performed well in this sustainability area. Particularly, *properly cleaned and maintain dock areas* (Ze), *properly maintained kitchen hood ventilation system* (Zd) and *properly maintained grease traps* (Zc) were perceived to be very important to respondents, and at the same time, educational restaurants performed very well on these green attributes.

Quadrant II, "Possible Overkill", contained four green attributes of low importance and high performance. Those four green attributes in quadrant II included *service of drinking water to quests only upon request* (H), *pressure regulated/properly calibrated low flow dish machines and steamer units* (D), *manual dish washing procedures that limit free running rinse water* (F), and *low flow/metered watering systems for interior and exterior landscaping* (J). Notably, these four green attributes were included in the water energy conservation areas. Even though respondents were satisfied with the water energy conservation practices, the educational restaurants should consider their present efforts and commitment to these attributes.

Quadrant III, "Low Priority", found nine green attributes that were ranked as having relatively low importance and low performance. Even though green attributes in this quadrant, compared with other green attributes, deserved the least attention from marketers, some of green attribute in this quadrant should not be ignored. For example, green attribute X (e*stablished relationships with third party charity feeders for utilization of unused or overproduced food items*) was very close to the overall importance and performance average. Thus, this green attribute should be fairly included in green marketing mix.

Quadrant IV, "Concentrate Here", indicated green attributes that must be strategically chosen to improve the overall green restaurant operations. A total of seven green attributes were perceived important to the respondents but failed to meet the green expectations from the respondents. Particularly, green attribute M (*ongoing maintenance and timely repair of refrigeration unit seals, gaskets, coils*) was extremely important (4.65), however educational restaurants performed below the average on this green attribute (3.41). The gap between these two mean scores was substantial, indicating educational restaurant operators must focus on improving this green attribute.

Implications

The implications of this study can be a valuable tool in helping all stakeholders of hospitality programs nationwide. Administrators can form strategic green planning as mandated by parent institutions, government, and society. Faculty will be able to plan and deliver green curriculums both in the classroom and the working laboratory. Students, intricately involved in and challenged by these green practices, will be able to transfer practical and theoretical understanding from an educational setting to the world of employment.

The seven major categories of green attributes presented in this study allow for specific comments and concerns. It is important to note the high density of responses in quadrant I of the IPA grid. This data shows that hospitality programs and their stakeholders

are participating at a high level in green practices. Just as important, the high density of responses located in quadrant IV of the IPA grid shows there is still work to be done. The low number of responses in quadrant II is a good sign that indicates institutions are spending their time and resources in a more positive manner. The moderate responses in quadrant III suggest that educational restaurants participate in green practices where and when they should.

The first of the seven major categories of green attributes presented to the survey group, Energy Conservation-Water-Kitchen, shows that, for the most part, water conservation is of low priority. An interesting point to be considered is that the highest single percentage of respondents (33%) was from the southwestern United States where water conservation has historically been a major consideration.

The second category, Energy Conservation-Water-Dining and Common Areas, suggest the same conclusions as above. Water conservation is a low priority. Some indications show that low flow/high efficient/metered units are in place without consideration of importance. Implied here, perhaps, are the realities of general building codes and government-mandated programs.

Category three concerns Energy Conservation-Electricity-Kitchen. Here, lighting rests in quadrant 1 of the IPA grid. This makes sense when compared to the practices of the country as a whole and the relative ease and low expense to purchase and use efficient lights and fixtures. Considering electrical kitchen equipment, the opposite is true. It is interesting to note that ongoing maintenance and timely repairs of high usage refrigeration units are of importance but not being practiced. The data here indicate that work needs to be done to conserve electricity as kitchens age and equipment are replaced, and as new facilities are being planned and constructed, high efficient products should be considered and maintained regularly.

Category four, Energy Conservation-Electricity-Dining and Common Areas, indicates a similar situation as in the kitchen. High priority is given to heating and air conditioning, perhaps mandated by parent institution policies. Heating, air conditioning, and general ventilation are expensive, especially in those parts of the country where seasonal temperatures demand action. Energy-efficient lighting and motion sensor lighting controls are of high importance but are not being used. Once again, as facilities age or are being constructed, efficient lighting and their controls in the dining room and in common areas should be considered.

The fifth category, Energy Conservation-Natural Gas-Kitchen, suggests "Energy efficient gas powered equipment such as range tops, stoves, kettles, water heaters" are of high priority to the respondents but is not being practiced. Gas-powered kitchen equipment is integral to most commercial kitchens, as the response indicates, and as facilities are updated or built new, efficient equipment should be considered. Proper maintenance of this equipment should also take place. In this category, two questions on alternative power were asked with both responses falling in quadrant III. Solar-powered equipment and the replacement of standard energy sources with alternatives were both of low importance and not being practiced. As these energy industries grow and costs for such services lower, alternative energies should be a consideration.

Category six, Material recycling, was answered favorably by the respondents with most response is falling within quadrant I. Purchasing products "packaged in recyclable, returnable, reusable containers" from "reputable vendors with recycling protocols practiced at the source" is a priority and is being practiced. Likewise, in-house educational restaurant recycling protocols are of high importance and are being followed. With most respondents (70%) living in populated urban or suburban locations, and in areas most in need of such services, utilization of unused, over produced food by donation to third party charities is of low importance and is not being performed. Local ordinances or institutional policies on food donations might affect this practice.

The green attributes of the seventh and final category, Pollution Prevention, fell heavily within quadrant I. Environmentally friendly cleaning supplies and chemicals are important and are being used in the kitchen, dining room and common areas. Wastewater is being kept from storm drains. Proper maintenance of grease traps and kitchen ventilation are important and are being performed. The proper maintenance and cleanliness of dock areas are also important and being performed. The positive responses to these attributes are encouraging and these practices should be continued. The use of environment friendly fertilizers in both the interior and exterior of educational restaurants is of high importance yet is not being practiced. Institutional or governmental regulations and policies might affect this practice.

Conclusion and Future Research

This empirical study is different from previous sustainability research in two aspects. First, unlike previous studies focusing on customers' perceptions of green practices and their impact on their behavioral intentions, this study

approached sustainability issues from the operators' perspectives. Accordingly, we included more specific and technical green practices that were perceived to be very important to the restaurant operators in the methodology. Second, we narrowed our scope of research to focus upon educational restaurants that are operated by hospitality institutions for student learning. The reasoning for doing so is that sustainability study at educational restaurants can help various stakeholders in higher education understand its impact on the environment and thus establish new ways to be more responsible for the social and natural environment.

This empirical research identified 32 green restaurant attributes in seven categories through an extensive literature review. Among them, green attributes in the category of energy conservation-electricity-kitchen were perceived to be the most important by operators of educational restaurants, while green attributes in the group of energy conservation-water-dining and common area were perceived to be the least important. On the other hand, green attributes in the category of pollution prevention performed the best. Overall, the results of the important-performance analysis (IPA) indicated a substantial gap between importance and performance of green attributes at learning restaurants with its performance failing to meet its importance.

Although this research filled notable gaps in green restaurant research, the findings and implications of exploratory research may be limited because of the small sample size. We identified a total of 197 educational restaurants operated by hospitality programs in the United States and 207 managers/operators of those educational facilities through a thorough and extensive search, eventually collecting 54 usable responses. It is strongly recommended that future research increase the sample size by adding educational restaurants from outside the United States. Furthermore, this empirical study should be extended to the different segments of the restaurant industry because the acceptance of green practices may be different among restaurants based on their target markets and customers.

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