The Impact of Guided vs. Self-Directed Instruction on Students' Information Literacy Skills

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Purpose of the Study. Given the shift toward an increasingly knowledge-based economy, educators and employers have expressed the desire to emphasize students' information literacy. Being information literate extends beyond the classroom setting and provides skills for independent investigations needed in internships and professional positions in marketing. However, in order to most effectively teach information literacy, what teaching styles are most appropriate? Should students be guided by the instructor or develop skills as independent learners? Our study determines the impact of a guided versus self-directed instruction method on students' information literacy skills.

Method/Design and Sample. Using a survey with objective and subjective measures of information literacy, we collected data from eight sections of an introductory marketing course, where some of the students were guided in their information literacy education, while the others learned through a self-directed approach.

Results. Results indicate that a scaffolding approach through guided teaching enhances information literacy more than self-directed methods. This suggests emphasizing guided information literacy instruction in undergraduate marketing education; however, raises questions about the role of student independence in the learning process.

Value to Marketing Educators. In many instances, the formal incorporation of information literacy in undergraduate marketing programs is still developing. We provide a unique contribution to marketing education by assessing which teaching methodology is most effective in developing, promoting, and assessing the critical and analytical thinking of students. Our findings are readily applicable to similar introductory marketing classes, which is beneficial to educators.

Keywords: Information literacy, marketing research, active learning, guided teaching, undergraduate education.

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With knowledge as a key driver for growth and productivity, educators and employers have expressed the need to emphasize information literacy in marketing curriculum (Devasagayam, Johns-Masten, & McCollum, 2012; Blaszczynski, Haras, & Katz, 2010; Korobili & Tilikidou, 2005). Information literacy is defined as the ability "to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (National Forum on Information Literacy (NFIL), 2014; Association of College and Research Libraries, 2013, p.2). Information literacy serves as the umbrella for all 21st centuries literacies(NFIL, 2014).Information literacy augments an individual's competency with evaluating, managing, and using information; thus, several regional and discipline-based accreditation associations now consider it as a key outcome for college students (NFIL, 2014).

Given that market information originates from diffuse sources, it is necessary to locate, compare and verify information from multiple outlets (Lavin, 1995). In addition, given the rapid increase in new information technologies, the proficiency in navigating those novel resources becomes especially imperative (Karns, 2005; Karns & Pharr, 2001; Benbunan-Fich et al., 2001; Atwong & Hugstad, 1997). However, previous research suggests that students consider searching information as more crucial than providing a critical evaluation of their findings and less than half feel confident in their critical thinking abilities (National Center for Post Secondary Education, 2001; Morrison, Kim, & Kydd, 1998). Thus, undergraduate marketing education should be enhanced with information literacy (Johnston & Webber, 2003; Morrison, Kim, & Kydd, 1998; Lamb, Shipp, & Moncrief, 1995).

An increasing number of employers emphasize that marketing job candidates should be prepared with

information literacy and the resulting critical thinking skills (Karns, 2005). In fact, a recent large-scale survey determined that more than one-third of business executives rank information literacy as the most desired marketing skill (Bertolucci, 2013). However, many of these executives complain that marketers do not have the requisite knowledge, which creates a major roadblock to executing better marketing strategies (Bertolucci, 2013). This increased emphasis on information literacy skills highlights the need for marketing educators to employ the most effective teaching style to achieve these desired learning outcomes.

LITERATURE REVIEW

Previous research suggests that the formal incorporation of information literacy in undergraduate marketing programs is still developing (Badke, 2010; Korobili & Tilikidou, 2005). Teaching information literacy may be challenging due to the confidence held by students related to digital technology. Students may operate under the assumption that because they are comfortable with technology, they are also proficient at finding and using information (Macklin, 2001). As a result of this assumption by students, there are shortcomings with solely relying on indirect measures (e.g. student surveys) to measure student learning (Macklin, 2001). Students' inability to properly assess their skill set increases the importance to utilize direct measures of student learning. The Macklin (2001) study also highlights the point that many students may not be familiar with the terminology regarding information literacy. Digital and information literacy are frequently used interchangeably, which means it is necessary to clarify these definitions with students during their marketing education.

Teaching Methods

Despite the variety of teaching methods that can be employed classes, there is little research or theory as to which method best facilitates learning (Anderson & Scott, 1978). An early landmark study by Dubin and Taveggia (1968) analyzed the results of 91 experimental studies that compared the effectiveness of teaching methodologies. Dubin and Taveggia's (1968) conclusions: there is no difference in the effectiveness of lecture vs. discussion pedagogies.

Using definitions by Dubin and Taveggia (1968), the guided lecture method assumes the superior knowledge of the lecturer. The instructor serves the role of a presenter and guides the students in each step of learning towards completing a larger project. While the guided approach helps the student to acquire information literacy knowledge in small steps, it minimizes the opportunity to experience the "trial and error", which is typical of experiential methods in which students learn in a self-directed way (Macklin, 2001). Self-directed (SD) instruction has become more popular in the undergraduate curriculum because critical thinking relies on student independence (Devasagayam, Johns-Masten, & McCollum, 2012).

Self-directed instruction is a student-centered teaching methodology, with the instructor serving as facilitator in the problem-solving process (Allen, Donhan, & Bernhart, 2011; Macklin, 2001; Sternhold, & Hurlbert, 1998). Experiential learning limits the influence of the instructor and challenges the student to learn independently through interaction with the provided materials (Dubin & Taveggia, 1968). It is reasonable to assume that given such distinctively different teaching methods as guided instruction and self-study, there could be measurable differences in learning outcomes of these two methods. Thus, there remains the need to assess which teaching methodology is most effective in developing, promoting, and assessing critical and analytical thinking of students.

HYPOTHESIS

Our study determines the difference between guided and self-directed instruction methods on students' information literacy. Guided by literature, we formulated three hypotheses to test. Given that information literacy is developing in terms of its formal incorporation into marketing curriculum, we propose that both pedagogies will result in improvements in student confidence related to achieving information literacy skills. However, because guided instruction scaffolds assignments and students gain more practice with information literacy, we believe that students will achieve higher levels of confidence as a result of guided instruction. And finally, because of the self-directed approach incorporates student problem-solving and critical thinking, we propose that self-directed methods will result in higher scores on objective measures of information literacy. More formally, the hypotheses are outlined below:

> H_1: A student's self-assessed information literacy skills will improve as a result of information literacy instruction, independent of the teaching approach.

> H_2: Students exposed to a guided approach will achieve a higher levels of confidence related to information literacy skills.

> H_3: As measured by direct methods and compared to guided instruction, self-directed methods will lead to greater improvements in information literacy.

METHODOLOGY

Isolating the teaching approach that is more effective in improving a student's information literacy skills involves data collection, developing a measurement instrument that accounts for a baseline (pre) and a acquired (post) information literacy skill set, and designing the environment for the control and treatment groups. As such, our methodology section is presented in the same structure.

Data collection

The research was conducted at a large (>15,000 students), public university in the Western United States. This university follows the quarter system, where each academic year is divided into 4 terms of 11 weeks: Fall (September through December), Winter (January through mid-March), Spring (April through June) and Summer (mid-June through the end of August). For three primary reasons, we selected an introductory undergraduate marketing course as a convenience sample: 1) information literacy skills are an important component of the course, 2) multiple sections of the course are taught at the university during the same quarter, and 3) the course is an introductory service marketing class that attracts a wide variety of majors. The class serves as a prerequisite for most marketing classes in the college. Students who need this class as a prerequisite may choose to take this class during their sophomore year, while others wait until their senior year to take the course. For the latter group, it may be the only marketing class that they take during their college career. Teaching information literacy is especially crucial in introductory marketing classes, where students are expected to assimilate knowledge and then apply it in subsequent upper-division classes that build on this knowledge. Prior to conducting the research, the Institutional Review Board deemed this study exempt. Students were given the option to complete the online surveys without incentive to participate. Data was collected from eight sections of the marketing class over three quarters.

Measurement Instruments

To carry out a complete investigation of the issue, measurements were taken at two points in time for each sample: at the beginning of the quarter through a pre-survey, and then at the end of the quarter after completion of the information literacy instruction via a post-survey. Pre- and post-surveys were matched using randomly generated respondent identification numbers. Both surveys included direct and indirect measures of student learning. Self-assessments served as measures of indirect learning. Students were asked to rate their confidence at achieving information literacy objectives through questions developed from the *Higher Education Information Literacy Standards* (Association of College and Research Libraries, 2013). Ratings were made on a 5-point scale with endpoints ranging from "could not accomplish" to "very certain I could accomplish". In addition, students were asked to rate their ability to obtain market research information using a 5-point scale with endpoints ranging from "needs significant improvement" to "excellent". We also incorporated survey questions regarding the student's familiarity with commonly used marketing databases, where student respondents had to indicate their familiarity with each database on a 5-point scale, ranging from "not at all familiar" to "extremely familiar".

In addition, direct measures of student learning were incorporated. A series of multiple-choice questions tested the student's ability to locate specific types of information using key databases (e.g. Hoovers, MRI Mediamark, U.S. Census). Possible answer choices included the key databases that students were exposed to during instruction (see Table 1 for example questions).

TABLE 1. EXAMPLE QUESTIONS USED AS DIRECT MEASURES OF STUDENT LEARNING

Question	Answer Choices		Correct Answer	
1) Which database would you most likely use to determine a product's parent company?	a)	Hoovers		
	b)	US Census	a)	Hoovers
	c)	MRI+ Mediamark		
	d)	Gale Marketshare Reporter		
	e)	I do not know, uncertain		
2) What database would you most likely use to determine food industry trends?	a)	MRI+ Mediamark		
	b)	US Census		
	c)	MarketResearch.com	c)	MarketResearch.com
	d)	Gale Marketshare Reporter		
	e)	I do not know, uncertain		
3) Which resource provides indices that show the likelihood of a consumer to purchase a certain product?	a)	First Research		
	b)	Hoovers		
	c)	ABI / Inform	d)	MRI+ Mediamark
	d)	MRI+ Mediamark		
	e)	I do not know, uncertain		

To supplement the two measures of student learning, we collected information about student enrollment, university standing, gender distribution, and quarter credit hours. Following Bacon and Bean's (2006) suggestion of using Grade Point Average (GPA) in marketing education research studies to increase the explanatory power of the findings with regard to student learning, we collected each student's GPA (measured on a 4.0 scale).

Design and Procedures

The premise of this research relies on a comparison of two teaching pedagogies, guided vs. self-directed. While both pedagogies may take the form of active learning (as they do here), differences

become apparent in the teaching approach. The self-directed approach requires a level of metacognition on the student's behalf so that they can assess their learning needs to complete a project, while the guided approach provides assignments that guide a student through the steps toward achieving the required learning. To compare the two different approaches, we used two groups of students, where each group solely experienced one teaching method.

To compare the impact of the teaching method on students' information literacy, a final marketing course project was used as the vehicle to teach and assess information literacy. The final project creates an applied information search experience that aims at developing students' critical thinking, written and oral presentation skills, and, their information literacy.

The dedication of additional time and resources to the marketing project was motivated by the desire to improve the collaboration between academic librarians and teaching faculty. We had observed a perceived barrier to getting students to access the library resources necessary to perform marketing research. Academic librarians, who frequently serve as an underused resource in the students' information quest, confirm these experiences (Dugan & Fulton, 2012; Macklin, 2001). Instead of just sending the students to the library to complete their information search for the final project, we organized a structured orientation into information literacy throughout the quarter. Before the quarter, we met with the college librarian to fine-tune the final project and set up a course-specific website with selected marketing databases. Additional meetings with the librarian throughout the quarter served as check-points regarding student progress and identified potential obstacles students might encounter in their information search. Thus, the course project created a symbiosis between essential marketing research skills and librarians' information assets. We set aside a full two-hour class for a 'crash course' on the ten key marketing databases with the college librarian. This two-hour class took place in a large computer lab to ensure that each student could learn how to navigate the databases individually.

During this session, the college librarian first presented background about each of the databases. Using their individual workstations, students would follow the different steps on how to retrieve the information. Then, we made time for a brief applied problem-solving session, which required students to solve several hands-on practice problems from a worksheet. These practice problems simulated a simplified setting of the final project scenario.

The project asked student groups to analyze the marketing and supply chain of a branded food product. Students prepare a SWOT analysis of the product's performance in the marketplace, backed up with facts, including sales and market share information. In addition, students define the product's target market and recommend changes to the marketing mix. The project hones information literacy skills by requiring the use of ten marketing information databases. At the end of the quarter, the project is submitted as a two-page infographic, complemented with a short class presentation.

In order to allow for a direct comparison of the impact of the two teaching approaches, each instructor taught all sections by solely using either the guided or the self-directed teaching method. To allow for a cross-comparison between samples and to isolate the differences occurring from the two different instructional approaches, we aimed to minimize alterations in individual teaching styles between course sections and quarters. We controlled for differences between experience, approach and personality through consistency with regard to the textbook, lecture slides, project requirements, access to resources, library information session, evaluation criteria, and weighting of the project with respect to the final course grade. Table 2 identifies key differences in the implementation of the guided teaching approach relative to the self-directed method over one quarter of the introductory marketing course. Each instructor solely used one teaching method over the course of the study.

TABLE 2: COMPARISON BETWEEN COURSE STRUCTURE OF INSTRUCTOR WHO USED GUIDED TEACHING APPROACH AND COURSE STRUCTURE OF INSTRUCTOR WHO USED SELF-DIRECTED TEACHING APPROACH

Week	Role	Instructor with Guided Approach	Instructor with Self-Directed (SD) Approach
1		Electronic pre-survey of information literacy skills, Submission deadline is end of first week of classes	
2	Activity	Students meet instructor and librarian in lab for applied session that provides overview of 10 databases	Initial introduction of project
	Purpose	Detailed instruction of databases	General introduction to spark interest
3	Activity	Homework #1: Application of 2-3 databases	

4	Purpose	Guided application of databases with performance feedback	
	Activity	Exam #1: Includes questions about databases	
	Purpose	Retention check	
5	Activity	Project formally introduced in class; teams and products assigned	
	Purpose	Explain project, evaluation criteria, and expectations	
6	Activity	Homework #2: Case study with application of 2-3 marketing databases	In-class competition to assess which team currently knows the most about their product
	Purpose	Guided application of databases with performance feedback	Touchpoint to give students a chance to assess their progress
7	Activity	Homework #3: Application of 2-3 databases	Students list what they know and what they still need to know in preparation for the library session
	Purpose	Guided application of databases with performance feedback	Encourage students to formalize questions about remaining work
8	Activity	Exam #2: Includes questions about previously learned databases	Students meet instructor and librarian in lab for applied session with an overview of 10 databases
	Purpose	Retention check	Detailed instruction based on student's questions and own needs for outstanding information
9	Activity	Instructors and librarian continue to check in with students	
	Purpose	Encourage students to exceed our expectations on the final project	
10	Activity	Project due and presentations of final project findings	
	Purpose	Assess student information literacy skills and application of marketing concepts	
11	Activity	Electronic post-survey of information literacy skills,	
	Purpose	Project submission deadline is last week of classes	

One of the student groups was guided step-by-step in their progress toward completing the final project. These guided learners completed homework assignments that taught them individual elements of the final course project. Thus, these assignments could be seen as scaffolding toward building the project. The other group obtained the full course assignment without any associated assignments. Without the aid of guided homework assignments, this self-directed (independent) learner group had to experiment on their own, and critically evaluate their information needs. These students were encouraged to become self-directed learners in the completion of the project, with the instructor serving as a facilitator in the process. This independent learner group did not have the opportunity to practice the application of databases in homework assignments prior to completing the final project. Yet, they were encouraged to ask questions, seek help as needed, and experiment with recommended resources.

RESULTS

The sample consisted of 164students enrolled in the five sections of the guided approach (150 completed both the pre- and post-survey), and 120 students in the three sections employing the self-directed teaching approach (104 completed both the pre- and post-survey). Table 3 shows the enrollments, response rates, and student characteristics. The distribution of student enrollment, response rates, gender distribution, academic standing, and credit hours per quarter were similar across groups. The one apparent distinction is the difference in the grade distribution, with the average cumulative GPA of 2.81 in the guided vs. 2.93 in the self-directed group. The difference in GPA is significant at the .05 level, which would suggest that the students in the self-directed class may be predisposed to performing better in this course compared to the students in the guided group.

TABLE 3: DEMOGRAPHICS AND ACADEMIC INFORMATION OF THE SURVEY GROUPS

Variable	Categories	Guided (n=164)	Self-Directed (SD) (n=120)
Sample			

Survey	Pre only	11		10	
	Post only	3		6	
	Both Pre and Post	150		104	
Response Rate	Enrollment	199		124	
	Response Rate	82.4%		97.0%	

Demographics

Gender	Male	51.3%	51.0%
	Female	48.7%	49.0%
Academic standing	Freshmen	6.7%	5.8%
	Sophomore	47.3%	40.4%
	Junior	24.0%	27.9%
	Senior	20.7%	26.0%
	Graduate	1.3%	0.0%

Academic Information

Average credit hours during quarter		14.9	15.1
Required course		79%	70%
GPA	3.51-4.00	3.9%	10.6%
	3.01-3.50	28.9%	35.6%
	2.51-3.00	42.1%	33.7%
	2.01-2.50	23.7%	19.2%
	Less than 2.00	1.3%	1.0%

Group Comparison by Teaching Approach
Self-reported skills and confidence levels

We identified differences between the guided and the self-directed groups with regard to the students' reported ability to achieve the information literacy objectives. Table4 provides results from the survey that we administered at the beginning of the quarter and again at the end of the quarter. Students were remarkably confident in their abilities across all information literacy characteristics. The highest average level of confidence was reported in their ability to effectively use information, with 63.8% in the guided and 64.3% in the self-directed group reporting above average skills. At the onset of this project, information literacy skills in need of most improvement included the ability to determine the quality of a source and properly reference that source.

TABLE 4: STUDENT SELF-REPORTED INFORMATION LITERACY SKILLS (SKILLS REPORTED ON A 5-POINT SCALE, WHERE 1= NEEDS SIGNIFICANT IMPROVEMENT AND 5= EXCELLENT)

Variable	Group	Pre-Survey		Post-Survey		Pre to Post (p-value)
		Mean	Indep. Sample t-test, p-value	Mean	Indep. Sample t-test, p-value	
Know when info is needed	**Guided**	3.57	0.985	4.07	0.539	0.000***
	SD	3.57		3.99		0.000***
Know type of info. needed	**Guided**	3.43	0.147	3.95	0.614	0.000***
	SD	3.60		4.01		0.002***
Locate information	**Guided**	3.32	.018**	4.12	0.302	0.000***
	SD	3.57		4.00		0.001***
Determine Source	**Guided**	3.58	0.348	4.14	0.432	0.000***
	SD	3.69		4.04		0.012**
Effectively use	**Guided**	3.72	0.349	4.17	0.951	0.000***
	SD	3.82		4.17		0.003***

Properly reference	**Guided**	3.44	.014**	4.09	0.348	0.000***
	SD	3.76		3.96		0.057*

The post-survey showed that after completion of the course project, students' self-confidence in their information literacy skills had increased, confirming the first hypothesis (H1). The biggest notable change from the pre-survey occurred in the guided group's ability to locate information, with an increase in mean values from 3.57 to 4.07 (on a 5-point scale). This increase in the guided group's self-rated skills closed the gap to the self-directed group. In the pre-survey, the self-directed group showed a higher self-reported ability at locating information (p=.018). However, at the time of the post-survey, that difference disappeared (p=.302). We found statistically significant changes between the guided group's pre- and post-survey self-reported ability to know when information is needed, what type of information is needed, locate information, effectively use information, and properly reference sources. Table 4 shows that the self-directed group started out with higher self-reported abilities and showed less improvement from the pre- to the post-survey responses.

Students were asked to rate their level of confidence in achieving information tasks used to complete the marketing project. Table 5 reports the results from this portion of the survey for both the pre- and post-scenarios.

TABLE 5: STUDENT CONFIDENCE IN ACHIEVING MARKETING RESEARCH TASKS (CONFIDENCE REPORTED ON A 5-POINT SCALE, 1= COULD NOT ACCOMPLISH AND 5= EXTREMELY CONFIDENT)

Variable	Group	Pre-Survey		Post-Survey		Pre to Post (p-value)
		Mean	Indep. Sample t-test, p-value	Mean	Indep. Sample t-test, p-value	
Determine parent company	**Guided**	3.36	.016**	4.37	.096*	0.000***
	SD	3.65		4.55		0.000***
Determine degree of processing	**Guided**	3.04	.000***	3.85	0.413	0.000***
	SD	3.55		3.75		0.105
Determine target market	**Guided**	3.58	.000***	4.45	0.825	0.000***
	SD	3.97		4.42		0.000***
Determine market shares	**Guided**	3.24	.068*	4.52	.003**	0.000***
	SD	3.47		4.15		0.000**
Determine industry trends	**Guided**	3.31	.001***	4.47	.000***	0.000***
	SD	3.65		3.99		0.004***
Determine key points	**Guided**	3.70	.083*	4.19	0.492	0.000***
	SD	3.90		4.27		0.000***

Students were most confident at finding the information source that helps to determine a product's target market. They also showed confidence in determining key points from a large set of information and were least confident in their ability to find market share information. The pre-survey further revealed differences between the confidence levels of the guided vs. the self-directed group (see the t-test values in Table 5). However, the post-survey showed that both the guided and self-directed groups showed significant improvements in their self-rated confidence levels in most measured areas (see Table 5 for p-values). The only area that did not show a significant improvement between pre -and post-surveys was the self-directed group's confidence in determining the degree of processing of a product. In the pre-survey, the self-directed group was more confident in their ability to determine the degree of processing for a product than the guided group (p=.000). By the end of the course, the guided group gained confidence (p=.000), while the self-directed group did not (p=105), resulting in the disappearance of the differences between the two groups (p=.413). Further, the differences that were once apparent between the two groups' confidence levels, as demonstrated in the pre-survey through questions about finding the parent company and the target market, vanished in the post-survey (see Table 5).

A couple key points become apparent from Tables 4 and 5. Student confidence levels are quite high at the onset of the study; however, the guided group's confidence level is initially lower compared to the self-directed group. As a result of the instruction about information literacy, confidence levels and self-reported abilities increase. Thus, the guided learner group shows greater improvements in their scores, confirming the second hypothesis (H2). This improvement closes the gaps between the guided group and the self-directed group in several variables.

Overall though, the confidence level of the self-directed students is still higher.

Database familiarity

As another way to identify differences between the two pedagogies, students were asked to indicate their familiarity with marketing databases using a 5-point rating scale. All of the databases were sources that were recommended for completing the final class project, and many of them were introduced during the library information session. Table 6 shows that students initially indicated that they were most familiar with Google and Wikipedia as information sources. The post-survey revealed substantial gains in students' database familiarity. By the end of the quarter, students' self-reported confidence levels in using Hoovers, Market Share Reporter, MRI Mediamark, and First Research were comparable to Google and Wikipedia.

TABLE 6: STUDENT FAMILIARITY WITH MARKETING DATABASES (PRE- AND POST-SCORES ARE MEAN VALUES BASED ON A 5-POINT SCALE, WHERE 1=NOT AT ALL FAMILIAR AND 5=EXTREMELY FAMILIAR)

Resource	Guided (N=150)			Self-Directed (SD) (N=104)		
	Pre	Post	P-Value	Pre	Post	P-Value
Library databases	3.25	4.30	0.000***	3.45	4.13	0.000***
Hoovers	1.80	4.51	0.000***	1.83	4.10	0.000***
Factiva	1.57	2.11	0.000***	1.67	2.16	0.000***
Wards Business	1.58	2.76	0.000***	1.60	2.56	0.000***
ABI Inform	1.81	2.76	0.000***	1.70	2.60	0.000***
Lexis Nexis	2.11	2.71	0.000***	2.13	2.69	0.000***
Academic Search Elite	2.19	2.77	0.000***	2.23	2.81	0.000***
First Research	1.64	4.44	0.000***	1.57	3.25	0.000***
MRI Mediamark	1.48	4.46	0.000***	1.34	3.75	0.000***
Market Share Reporter	1.54	4.33	0.000***	1.50	3.55	0.000***
MarketResearch.com	1.60	3.74	0.000***	1.64	3.18	0.000***
USDA Census	2.79	3.15	0.001***	2.84	3.25	0.001***
USDA ERS	2.58	2.95	0.003***	2.67	3.23	0.000***
Nutrient Database	2.41	2.91	0.000***	2.58	3.02	0.001***
Google	4.60	4.79	0.011**	4.82	4.86	0.510
Wikipedia	4.01	4.36	0.001***	4.55	4.64	0.358

Notes: Pre- and post-columns report the mean values assigned by students in each group related to a 5 point rating scale of familiarity, where 1= not at all familiar and 5= extremely familiar. Significance levels are reported at the .1, .05, and .01 levels and respectively indicated using *, **, and ***.

Direct measures of student learning

In addition to asking students to rate their self-confidence, we included objective questions to directly test student's learning of information literacy skills. Students obtained a score based on their correctly submitted answers. In order to test the reliability of our different learning measures, we used Cronbach's alpha, which we measured for the complete sample, and for both pedagogical groups separately. We found that Cronbach's alpha suggested a high level of internal consistency between direct and indirect measures of learning. For the complete sample, Cronbach's alpha was .872, while the guided and the self-directed groups had levels of .881 and .860, respectively.

Students in both groups scored low on the objective portion of the pre-survey and, consistent with their initial lower self-confidence ratings, the overall scores of the guided group were less than the self-directed group's scores. Students in the guided group averaged 39% correct answers and those in the self-directed group averaged 41%. There was no statistically significant difference between the two groups (p=.616). The post-survey showed that by the end of the quarter, scores increased to 78% for the guided learner group and 70% for the self-directed group, a statistically significant difference (p=.010).Both groups showed statistically significant improvements between their pre- and post-levels at the .01 level. However, related to the third hypothesis posed in this research (H3), these results suggest that guided instruction, and not the self-directed method, lead to greater improvements in information literacy.

Influence of class elements

The post-survey asked students to rate the influence of class elements on their information literacy skills: library information session, final course project, course assignments, and prior experiences. Effect sizes for the two groups (guided and self-directed) were calculated across each class element using Cohen's d. Based on Cohen (1992), with the exception of prior course work and prior experiences, these effect sizes can be classified as medium to large. Subsequently, the effect sizes confirm differences between the two pedagogical treatments. Both groups identified the course project and the library session as the most influential aspects of the course. Interestingly, the self-directed group reported the influence of the final course project and the library information session as significantly higher than those in the guided learner group. Despite the information literacy assignments that characterized the guided group's experience, there was no difference between the reported influences of the course assignments.

DISCUSSION

The learning objectives for this introductory marketing courses aim at creating a familiarity with the basic concepts of information search. Being information literate extends learning beyond the formal classroom setting and provides practice with independent investigations that students will need in internships and professional positions (Association of College and Research Libraries, 2013). We employed both direct and indirect measures of student learning of information literacy and found consistency between the two measures, suggesting the reliability of indirect measures of student learning.

Our findings are readily applicable to marketing courses that include information literacy as a learning objective. We present the grounds for discussion on the future trend of information literacy in marketing education and two teaching methods that may enhance critical thinking. Results suggest that both a guided and a self-directed teaching approach lead to gains in information literacy, but that the guided method may, in fact, be more effective in the short term. Self-directed approaches help students become aware of how facts will be used prior to obtaining the information, which may result in transferable and sustained learning (Hallinger & Lu, 2011; Stepien & Gallagher, 2003). However, since self-directed instruction depends on self-motivation, procrastination might prevent students from getting started early enough to critically evaluate the results from a thorough information search.

Our study showed that students were unfamiliar with most marketing databases, despite potentially being exposed to them in an earlier course. Consistent with other information literacy research (e.g. Gross &

Latham, 2007; Kruger & Dunning, 1999), we observed a disconnect between what students know and what they *think they know* (high confidence and low performance). Both approaches broadened the students' knowledge from sites like Google and Wikipedia to the academic sources Hoovers, Market Share Reporter, and First Research. In particular, the guided teaching approach showed increased levels of confidence in the ability to utilize databases.

Students' prior experiences with formal education have likely been shaped by a guided approach. Thus, it makes sense that students continue to perform better under the same pedagogical approach. Ultimately though, students need to know how to become self-directed learners. The problem-solving skills associated with self-direction are necessary in graduate school and highly valued in the workplace (Boland & Akridge, 2004). The two teaching strategies employed are nearly synonymous with pedagogy and andragogy. In contrast to pedagogy, andragogy encompasses teaching strategies designed for adult learners and requires students to move from dependence to self-direction. Learning becomes more problem-based rather than subject-based. However, andragogy is dependent on the students' maturity, their ability to pull from an existing knowledge base, and their readiness to learn (Knowles, 1970). While the students in the self-directed sample appeared to enhance their information literacy, the improvements were not as profound as students exposed to the pedagogical or guided approach. However, if we are educating future marketers to become self-directed, independent problem solvers, at what point do we take away the guidance and teach them to become self-directed learners?

Limitations and Directions for Future Research

Even with attempts to standardize the class instruction, there was a natural variation within the class due to the instructors' different personalities. However, it is also typical for a single instructor to show variations in energy, mood, and level of knowledge between quarters, and possibly even weeks of an instructing a single course. Despite these limitations, we provide a unique contribution to the literature by comparing both direct and indirect measures when assessing student learning of information literacy. To our knowledge, no previous study on teaching strategies has collected data of a comparative sample in order to assess how to enhance information literacy in marketing research. The availability of this information will guide marketing teaching methods towards more effective student learning. Future research opportunities may explore the role of team dynamics on information literacy in order to understand the contexts that contribute to the success of one pedagogy versus the other.

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