



## Fostering Information Literacy in the Management Education at the U.S. Coast Guard Academy

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**Abstract:** This paper illustrates the information literacy (IL) strategy in an undergraduate Management program at U.S. Coast Guard Academy. The paper exemplifies a sequential approach that improves students' capabilities to evaluate and apply information in a specifically designed learning environment while generating new knowledge in undergraduate business coursework. The paper also emphasizes how IL can be developed within management coursework through a six-step process, including defining, locating, selecting, organizing, presenting, and assessing. This specially designed framework of IL learning can be applied across all relevant courses using specially designed assignments in the Management major.

**Keywords:** Management Education, Information Literacy, Strategy, Assignments, Curriculum Integration

### 1. Introduction

Information Literacy (IL) has been recognized as a vital learning outcome and a lifelong learning skill [1, 2]. In *Information Literacy Competency Standards for Higher Education*, the Association of College and Research Libraries [3] developed accreditation standards to respond to the challenges of enhancing IL initiatives. As a result, IL education is considered as a standard pedagogical instrument that improves students' IL capabilities while mastering required subject [4, 5, 6]. As today's IL instruction is no longer confined to traditional library instruction [7, 8], academic programs create opportunities for independent learning where students use numerous information

sources to develop and master their specific skills or knowledge [9-12].

Pedagogical research has demonstrated the importance of the IL education and its impact on students' satisfaction with their undergraduate program [13], the quality of assignments and undergraduate research projects, and lifelong learning skills [2]. IL instruction is most successful when it is associated with hands-on, case-based and problem-based learning using assignments or written essays, or research projects within a course as opposed to a stand-alone subject delivered by library staff [5, 6]. Studies promote the integration of IL skills development across curricula and the use of

case studies and authentic situations across study assignments, research papers, projects, and presentations [14]. Advocates of IL argue that specifically customized IL programs at any college level benefit students by allowing them to master IL skills from a basic level to a level of IL confidence, fluency, and proficiency [15].

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that specifically customized IL programs at any college level benefit students by allowing them to master IL skills from a basic level to a level of IL confidence, fluency, and proficiency [15].

In response to this challenge, the ACRL established the ACRL Information Literacy Competency Standards for Higher Education and a definition of an IL person [16]. Those IL standards emphasize finding and selecting appropriate information, and critically evaluating the use of information to produce understanding and application of new knowledge. Development of those IL skills must also allow students to complete their IL tasks effectively, legally, and ethically [17].

This paper presents how the IL strategy is used in an undergraduate program of the Management Department at U.S. Coast Guard Academy (USCGA). The attainment of the IL educational goals is based on the ACRL [17] definitions and assessment outcomes. The paper begins with an overview of IL process within the undergraduate management coursework at USCGA. The paper provides an example of an IL assignment framework that was implemented across selected management coursework. The authors provide an assessment process that was conducted in one of the courses to demonstrate that the IL strategy can be successfully implemented. This paper contributes to the existing literature on educational challenges in IL by providing a comprehensive strategy for its advancement and assessment throughout entire undergraduate curriculum [18].

## 2. Literature Review on Information Literacy

Learning theories and pedagogical approaches to IL have been of a great interest in pedagogical literature especially over the last two decades. Information literacy is much more than technological competence or online research as it inspires critical thinking and reflection in the context of the increasingly

wide-ranging volumes of information available through a numerous of technologies. For example, Allen [19] presented the importance of active learning in IL pedagogy while Mokhtar [20] illustrated IL instruction in the context of learning styles. Other authors [21, 22] argue that collaborative learning and resource-based learning can be easily used to stimulate IL learning. Wang [23] used sociocultural theories to IL activities where the students were expected to foster student-centered learning in a collaborative learning environment. Keene [24] used Bloom's Taxonomy of cognitive skills while providing IL instruction.

Based on literature review, currently there are four major approaches to IL pedagogy. According to Eisenberg [25], those approaches include: (1) extra-curriculum – a course outside of academic curriculum; (2) inter-curriculum – a session add-inn to an academic course; (3) inter-curriculum – integrated into a course; and (4) stand-alone – an independent course within academic curricula. According to Black [26], a combination of those four approaches provides an effective IL method. Today's IL educational approaches go far beyond the library instruction as faculty across all majors independently or together work with library staff to provide IL education [27-30].

This paper supports this above argument, stating that an effective IL instruction must be accomplished simultaneously at the institutional level, the program level, and the course level. Regardless of the process selected, IL approach must be sufficient to meet the goals for students' learning at the levels and in the disciplines for which it is offered. A single course won't be able to satisfy all of an institution's information literacy goals, because the skills should be addressed and reinforced at various levels of sophistication throughout a student's academic career. If students take multiple information literacy courses, the overall

curriculum should contain of complementary and progressively advanced components.

The authors of this paper also argue that as academic institutions respond to the challenges of their IL initiatives, they unquestionably identify that faculty, librarians, and other administrative staff must address many aspects of IL together. IL supports pedagogy focused on the development of effective research, critical thinking, and writing or other communication skills where faculty members are able to identify these key characteristics in courses they develop and teach. Institutions committed to developing IL programs, ensure that their curricula and faculty work toward teaching students to be self-directed learners and problem-solvers.

Incorporating IL instruction into specific disciplines, enables students to apply their skills into their majors as each discipline can have its unique approach to IL. Research on IL demonstrates that implementation of IL modules allows students to achieve the outcomes associated with IL. Implementation of specially designed IL assignments and coursework based on a progressive approach and a rigorous assessment plan delivers a successful IL process. The assessment process is critical as it reveals that reinforcement of previous topics, while introducing new, more complex content, improves the retention of knowledge in the context of IL [31].

### **3. Information Literacy Education in the USCGA**

The USCGA is a public institution that provides an academic undergraduate education as well as physical and military training to the cadets who will serve as leaders in the United States Coast Guard (USCG). The Academy's mission is to educate, train, and develop leaders of character who are ethically, morally, intellectually, and professionally prepared to serve their country and humanity. In order to meet these goals, the Academy's holistic education delivers academic, physical

fitness, ethical, character and leadership development programs. As military professionals, the USCGA cadets are expected to be responsible for their own behavior, hold others accountable, and to display devotion to the mission of the USCG and the Department of Homeland Security.

The Academy provides undergraduate academic coursework that is supported through required courses within humanities, science, engineering, mathematics, maritime studies, organizational behavior, management, and law.

**Table 1.** The USCGA and Management Department Learning Goals

United States Coast Guard Academy Shared Learning Outcomes	Department of Management Learning Outcome Areas
<p><b>Leadership Abilities:</b> Graduates shall be military and civilian leaders of character who understand and apply sound leadership principles and competencies. This includes the ability to direct, develop, and evaluate diverse groups; to function effectively and ethically as a leader, follower, facilitator or member of a team; and to conduct constructive assessment of self and others.</p>	<p><b>Leadership:</b> Graduates of the Management major shall be leaders of character who understand and demonstrate sound leadership principles and competencies. Graduates shall function effectively as leaders, followers, and facilitators. Graduates shall be able to conduct critical self-reflection and assessment. Graduates shall be able to direct, develop, and evaluate diverse individuals and groups.</p>
<p><b>Personal and Professional Qualities:</b> Graduates shall maintain a professional lifestyle that embraces the Coast Guard Core Values of Honor, Respect and Devotion to Duty, includes physical fitness and wellness, and demonstrates the customs, courtesies and social skills befitting members of a maritime military service. Graduates shall also have a sense of Coast Guard maritime heritage and an understanding of the roles that the Coast Guard and the nation play in the global environment.</p>	<p><b>Information literacy:</b> Graduates of the Management major shall be leaders who possess the ability to know when there is a need for information, to be able to identify, locate, evaluate and effectively use that information for the issue or problem at hand.</p>
<p><b>Communication Effectiveness:</b> Graduates shall be able to write clearly, concisely, persuasively, and grammatically; prepare and deliver well-organized and polished oral presentations; read and understand a variety of written materials; listen thoughtfully to oral arguments; respect diverse opinions; and formulate reasoned alternatives and responses.</p>	<p><b>Communication Effectiveness:</b> Graduates shall be able to write clearly, concisely, persuasively, and grammatically; prepare and deliver well-organized and polished oral presentations; read and understand a variety of written materials; listen thoughtfully to oral arguments; respect diverse opinions; and formulate reasoned alternatives and responses.</p>
<p><b>Ability to Acquire, Integrate and Expand Knowledge:</b> Graduates shall have developed the motivations and skills for "lifelong learning."</p>	<p><b>Ability to Acquire, Integrate and Expand Knowledge:</b> Graduates shall have developed the motivations and skills for "lifelong learning."</p>

<p>Graduates shall be able to create a working conceptual framework that lends itself to continued expansion. To accomplish this, graduates shall be able to efficiently access a broad range of information sources, locate and interpret desired data reliably, employ appropriate technology, and integrate knowledge. Graduating cadets shall also have acquired and integrated the specific in-depth knowledge required of both an academic major and an entry-level professional assignment. The Leadership Development Center course graduates shall have accomplished all program objectives.</p>	<p>Graduates shall be able to create a working conceptual framework that lends itself to continued expansion. To accomplish this, graduates shall be able to efficiently access a broad range of information sources, locate and interpret desired data reliably, employ appropriate technology, and integrate knowledge. Graduating cadets shall also have acquired and integrated the specific in-depth knowledge required of both an academic major and an entry-level professional assignment. The Leadership Development Center course graduates shall have accomplished all program objectives.</p>
<p><b>Critical Thinking Ability:</b> Graduates shall be able to accomplish complex tasks in a broad range of contexts by applying the basic skills of critical analysis, systems thinking, quantitative reasoning, risk management, creative problem solving, and value-based decision-making.</p>	<p><b>Critical Thinking:</b> Graduates of the Management major shall be able to effectively integrate their knowledge and skills of/in leadership, communications, technology, and business competencies into a rational decision-making and problem-solving framework.</p>

Source: Developed by Department of Management, USCGA

The Department of Management at USCGA delivers an undergraduate management education where Management majors are expected to develop and master *business competencies, communication, self-leadership, critical thinking, and information literacy skills*. These skills, as illustrated in Table 1, are closely related to the shared learning outcomes across all majors at USCGA.

The USCGA Management department recognizes that IL skills are critical to the success of the USCG as an organization. The Academy requires all graduating cadets to understand and fully adapt to the characteristics of the information age. The IL strategy has been developed with the assistance of the librarian staff who implemented training sessions across the USCGA curriculum. Table 2 presents a list of courses that are currently involved with specially designed IL training elements across all majors during four years of undergraduate study at USCGA. The Management department

at USCGA develops IL skills across its curriculum in addition to all other IL training included in other non-management courses. The goal is to advance IL skills progressively throughout all four years of an undergraduate program as illustrated in Figure 1. Those courses highlighted have specially designed assignments to advance IL skills.

The Management department faculty has used the ACRL Information Literacy Competency Standards for Higher Education. According to the ACRL definition, an information literate person is defined as someone who can: (1) *determine the extent of information needed*; (2) *access the needed information effectively and efficiently*; (3) *evaluate information and its sources critically*; (4) *use information effectively to accomplish a specific purpose*; and (5) *obtain and use information ethically and legally* [32].

**Table 2.** A List of Courses Included in the IL Education

American Government	Principles of Macroeconomics
American Social Movements	Management Information Systems
Civil Engineering Design	Marine Engineering
Coast Guard History	Maritime Watch Officer
Design Project Management	Marketing
English Composition and Speech	National Security Policy
Environmental Engineering	Ocean Dynamics
Ethnic Literature in the United States	Operations Analysis
Gender and Sexual Orientation in Literature	Organizational Behavior and Leadership
Intelligence and Cyber Operations	Petroleum and Oil Spill Science
Intro to Mechanical Engineering Design	Physics I and II
Introduction to Business	Principles of Ship Design
Introduction to Latin American Studies	Reinforced Concrete Design
Literature of Humanity and Conflict	Social Science Research Methods
African American Literature	Soil Mechanics

**Source:** Management Department, the U.S. Coast Guard Academy.



**Figure 1.** Management Department at U.S. Coast Guard Academy Shared Learning Outcome and Information Literacy

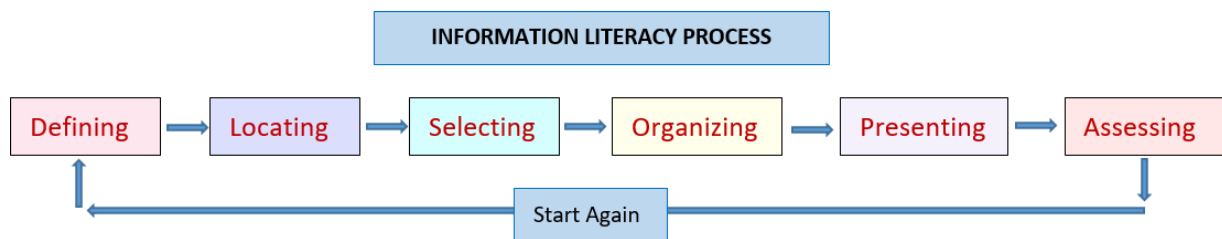
Source: Management Department, the U.S. Coast Guard Academy.



IL Outcomes	Baseline Novice	Progressing Apprentice	Proficient Journeyman	Distinguished Master
Determine the Extent of Information Needed	F R E S H M A N	S O P H O M O R E	J U N I O R	S E N I O R
Access the Needed Information				
Evaluate Information and Sources Critically				
Use Information Effectively to Accomplish a Specific Purpose				
Obtain and use Information Ethically and Legally				

Source: Developed by the IL Committee at USCGA.

Figure 2. The U.S. Coast Guard Academy IL Competencies by Academic Grade



Source: Based on New South Wales Department of Education and Communities Model: Creative Commons, 2011: <https://pepechick63.wordpress.com/information-literacy/>

Figure 3. IL Process

IL education in the Management Department must guarantee that those skills are developed across the curriculum so that every graduating student becomes IL competent as defined by the ACRL. In order to integrate IL across the Management curriculum, faculty must recognize that it is critical to identify potential courses each year for IL integration. IL must be integrated into the course content, assignments, and the course lectures. In particular, the integration of IL in coursework projects enables students to recognize when information is needed and to develop a capacity to locate and use information effectively as stated in the intended assignment. IL must be integrated into the course objectives and class activities where the objectives of the course introduce students to new methods of gathering,

processing, and presenting information. The IL competencies are targeted expectations for freshman, sophomore, junior, and senior levels as presented in Figure 2.

In the Management Department at the USCGA, the first IL educational step is presented by the librarians who help students find information resources for their assignments. Library staff offer tutorials that allow students to perform hands-on exercises to reinforce IL concepts that were taught during lecture. Following these exercises, students are required to complete online practice which focuses on searching and finding resources and databases. The librarians are invited to co-teach the IL concepts in order to acquaint students with how to find specific information. The course research assignments are intended to help students learn how to select and narrow an

appropriate topic, conduct research, write a research paper through multiple drafts, and construct bibliographies. They also allow students to explore in detail a specific issue within the course while effectively, ethically and legally using acquired information. Students become critical thinkers within the topics of their research papers, and they learn by applying their specific knowledge while developing a final project.

The Management faculty provide IL assignments within their own courses where they expect students to develop an ability to frame research questions and locate, evaluate, manage, and use information in a required context. They also expect students to retrieve information using a variety of media; demonstrate the ability to interpret information in a variety of forms, such as written, graphs, charts, diagrams and tables; and critically evaluate information. The IL strategy or process consists of six key components with related tasks that are summarized in Figure 3.

The six elements or steps of the IL process include defining, locating, selecting, organizing, presenting, and assessing which must be demonstrated across a four-year undergraduate program when students complete IL tasks. Every year, students are expected to progress through this six-stage framework in order to improve their IL skills over four years. As a result, at the senior level students must acquire the essential understanding of the locating and accessing issues, the research process, critical thinking and evaluation of information, citation, and documentation. The intent is that their senior projects will demonstrate all these abilities.

Pedagogical approaches to all teaching students how to find and evaluate sources are individualized across the disciplines involved. The essentials how to find and evaluate sources are addressed through lectures, library discussions and visits, and in-class assignments and writing workshops. For

example, in introductory courses, such as Macroeconomics Principles, in-class and library-assisted workshops illustrate the differences between research and popular sources of information. In this course, students must produce a research assignment while using a range of library and electronic sources focused on the development of a thesis statement and proper documentation using a formal editorial style. At this IL level, these research writing assignments can be challenging when students are expected to examine a range of academic and popular sources as they process and develop their own written responses.

In more advanced courses, students start understanding the complex nature of information within other techniques. Students can gain significant insights about IL through their own creation of information in writing assignments. These insights can result from learning opportunities that go beyond lectures or library instruction and require students to make decisions regarding the information they select, organize, apply, and assess while completing term papers. Active learning assignments in research, writing, oral or visual presentation can also challenge students to engage in critical analysis and evaluation of information that is collected and applied. The Management faculty commonly use short papers that examine specific sources, such as a scholarly journal article, or assignments that require students to compare the structure and content of scholarly and popular sources.

#### **4. Structuring IL Assignments in Management Coursework**

Table 3 presents a detailed IL process that has been used while structuring assignments, term papers or small research projects in Management Department coursework



**Table 3.** IL Information Literacy Process and Structuring Assignments, Paper & Research Projects

STAGES	INFORMATION LITERACY PROCESS
<b>Defining</b>	What is the purpose? Identify key words and find their meaning; Create your own focus questions in response to the tasks; Brainstorm on your current knowledge and organize tasks; identify the need for further information.
<b>Locating</b>	What sources can I use? Refine search using key words and search terms; Identify appropriate resources; Recognize the relevancy of the resources and the bias and authority of the information available
<b>Selecting</b>	How relevant is this information? Select information from variety of resources; Compare information from different sources and recognize the bias and authority of information available; Discard information that is biased and not useful.
<b>Organizing</b>	Do I have enough information? Do I need to use all this information? Organize selected information in a logical and sequential order from major to minor ideas; From the body of evidence make proves judgements and generalizations and from this draw relevant conclusions.
<b>Presenting</b>	What will I do with this information? Who is my audience? Present an informative and relevant response to the task topic; Demonstrate a logical and clear understanding of the task topic by providing appropriate conclusions; Use an appropriate written and oral genre; Recognize and use the variety of multimedia options available to present a response that will suit the audience and purpose.
<b>Assessing</b>	Did I fulfill my purpose? How did I go with each step of the information process? Assess the quantity, quality and relevance of information in relation to the task; Revisit stages of the process to ensure all aspects of the tasks are met; Identify the steps of the information process that need improvement.

Source: Management Department, the U.S. Coast Guard Academy

The IL process begins with the students *defining* their project topic. They conduct a literature review where they *locate* credible sources that pertain to their overall project topic. Faculty then provide feedback to the students on the quality of the literature review including the relevancy, credibility, and reliability of the data and sources presented. The information from the literature review is then used to properly scope their project considering expectation and needs. After *selecting* the appropriate sources of information, students move forward with relevant and applicable documents and articles. Then, the students interpret and synthesize the information to produce specific

recommendations. Finally, they utilize frameworks to *organize* the data and present in a logical format. Once they complete their assignments, students are expected to *present* their projects to interested parties and USCGA faculty. Throughout the entire process and during the presentation phase, students are *assessed* by peers and faculty given regarding the quality, clarity, and relevancy of their work. This completes the IL cycle for the course. The entire process uses multiple iterations of the IL cycle and ensures high quality work projects from the student groups. This IL skills process can be designed and integrated into assignments and collaborative research projects during all four years of study

**Table 4.** Assessment of IL Skills

IL OUTCOMES	IL SKILLS CHARACTERISTICS	Learner's Self-evaluation	Teacher's Evaluation
		(Circle one for each stage)	
1. Know	Determines the nature and extent of information needed	D C E	D C E
2. Access	Efficiently and effectively accesses information sources	D C E	D C E
3. Evaluate Sources	Critically evaluates information sources	D C E	D C E
4. Evaluate Content	Critically evaluates information content; Considers impact on student's prior knowledge, value system, and future direction in life	D C E	D C E
5. Use	Uses information found to accomplish a specific purpose	D C E	D C E
6. Ethically Legally	Understands the economic, legal, and social issues surrounding the acquisition and use of information	D C E	D C E

.D - Developing, C - Competent, E - Exemplary

**Source:** Management Department, the U.S. Coast Guard Academy.

## 5. Assessment of IL Development

There are several assessment methods discussed in literature and the recommended tools include checklists, rubrics, conferencing, portfolios, reports, oral and written examinations, and other approaches [33]. Assessing IL progress is a major component of IL process at USCGA. The IL assessment initiatives include both direct and indirect means of assessments.

The IL skills assessment of individual student learning is completed across selected and designated courses in the Management department. This assessment process has been implemented to improve advancement of IL competences among students.

The use of a rubric assessment of IL has been considered as a valuable tool for both

USCGA librarians and faculty seeking to demonstrate evidence of students' learning. In selected courses, IL skills are being evaluated within the following competences: (1) determine the nature and extend of information needed; (2) efficiently and effectively access information sources; (3) critically evaluate information sources; (4) evaluate content; (5) use information found to accomplish specific purpose; and (6) understand the economic, legal, and social issues surrounding the acquisition and use of information.

The instrument to assess IL development, presented in Table 4, illustrates the Academy's progressive approach on developing and accessing IL skills. In first year, students perform IL skills at a *Developing* level, in sophomore year at a *Developing/Competent*

level, in junior year at a *Competent/Exemplary* level, and in senior year at an *Exemplary* level.

The goal is to implement this instrument across all other Management courses at the USCGA. This instrument is being used by instructors in selected management courses at every stage of students' progression with their homework or term project. The next section presents an example of developing and assessing IL skills in Macroeconomics Principles Course.

## 6. An Example of Developing and Assessing IL Skills in Macroeconomics Principles Course

In order to teach IL effectively, the *Principles of Macroeconomics* course develops the pedagogical framework of problem solving in the freshman year. The IL skills process was designed through group projects where students have to share the responsibility for successfully completing their group projects and are required to go through and develop the IL process through *defining, locating, selecting, and organizing* the information that is needed to complete the assignment. All groups at the end of class present these projects. In this course, students reinforce learning of basic macroeconomics concepts in addition to development of IL skills. This assignment demonstrates that teaching IL skills must be combined together with learning the basic macroeconomics concepts and theories. Example of *the IL Principles of Macroeconomics Assignment* is provided below.

Assessing student learning is a major focus of IL education at the CGA. Rubric assessment of IL is an important tool for both CGA librarians and faculty seeking to show evidence of cadet learning. Table 4 presents the Management Department in Principles of Macroeconomics course instrument for assessment of IL skills. The assessment instrument we used places students for each IL

outcome into three categories: *developing, competent, and exemplary*. This approach mirrors the language used in the critical thinking, leadership and communications skill's assessment completed annually for each student in the Management major. For example, all freshman students should be beyond *developing* by the end of the Principles of Macroeconomics course. As it is expected that all students are *competent* or *exemplary* in IL levels while entering their second year of undergraduate college, any students found to be *developing* in a skill expected of them should have a conversation with the faculty member and/or their academic advisor to determine a strategy to improve. Each individual progression is carefully traced and the students are provided with the instructor's feedback progressively to make sure that all students advance. If a student does not progress, extra assignments can be used to allow the student to catch up and be ready for the next academic year.

In fall 2017 and spring 2018, 150 students completed a self-evaluation of their IL skills. The instructors were also required to complete evaluations of their students' IL skills progress. Figure 5 illustrates the instrument and the results for the Principles of Macroeconomics courses during those two semesters. As Principles of Macroeconomics is a freshman level course, and to align the project's IL skills with the IL goals of the department, the minimum expectation for all students in the course is to be "developing" at each IL outcome.

As illustrated in Table 5, no student was recorded by the teacher as *developing* for any of the six skills measured. This aligns with the goal of having no freshmen students in the *developing* category. In addition, as the results indicate students seemed to evaluate themselves lower than their teachers. All students as well as the teacher evaluated category six, *ethically legally, as exemplary*. Additional analysis will be conducted on the results from the subsequent semesters for this



course as well as for the selected courses across the Management department's curriculum.

### EXAMPLE: Principles of Macroeconomics (FRESHMAN LEVEL)

#### Principles of Macroeconomics/Information Literacy Assignment

Name \_\_\_\_\_ Section \_\_\_\_\_

The purpose of this assignment is to allow you to explore basic Macroeconomics concepts beyond what we discussed in class as well as to allow you to understand them better and to take informed positions on them. This project is also expected to concentrate on improving your information literacy competency. You will need to frame a topic, choose workable databases, and sources concerning the topic, and briefly cite and evaluate these resources you chose to use. In order to complete these assignments please work the following tasks.

Please seek assistance from the library staff whenever you have questions about the databases or the research process. The topic selected and the question that you seek to answer may not be represented in each type of source available in a library catalog or online. It's not likely that you'll find a whole magazine article, a whole newspaper article, or a whole book, on that exact topic. Please be flexible and learn to examine each resource for any relevant information it may contain about your topic and the question you seek to answer. If you can't find information on a topic please see your instructor or a librarian. When you search, try different terms, and keep track of the terms that work well. You will notice that change in a term typed during your library will provide different results.

Select one of the following topics and then answer the following questions that are listed below.

1. Explain how the concepts of scarcity, incentives, opportunity cost, and marginal analysis affect economic decision making.
2. Analyze the role of supply, demand, and prices in a market economy and the necessary conditions for a market economy to function well and then describe and critique the role of government in a market economy.
3. Explain the importance of long run economic growth, and the factors that contribute to growth.
4. Explain the concept of comparative advantage, the gains from international trade, the role of exchange rates, and the effects of globalization.

#### (DEFINING) What do I want to find?

- Choose a topic of your assignment proposed by your instructor; What issue are you examining/what questions are you trying to answer? Determine possible key words or terms to begin database searching. Limit your search to get better results

#### (LOCATING) Where can I find the information I need?

- Control vocabulary and keyword searches; Search engine directories and then Create a documentation file of research activities and their outcomes; and Access suggested databases, listing key words/terms used in each one

#### (SELECTING) What information do I need to use?

- Evaluate each database and record potentially useful sources of information and items for further evaluation
- From the materials identified above, select (and justify your choices)
  - three books or selections/chapters from books/three articles from scholarly journals/three articles from general audience (popular) magazines or newspapers/three sources from an Internet search engine (www.Google.com),
- Select those sources that provide the best and most reliable information and evaluate selected information for its accuracy, relevance, and content
- Read the text and select main ideas and justify your choice and selection process

#### (ORGANIZING) How can I use information?

- Complete your database search, list all selected resources, and evaluate all information selected
- Recognize interrelationships among concepts and combine them into primary statements with supporting evidence
- Organize your resources based on relevance and importance of your search and cite all sources that you selected and organized in the reference style attached to these guidelines

#### (PRESENTING) How can I present this information?

- Present information ethically and legally; Organize facts by topically/chronologically/value/contribution; Identify each article's significance and potential contribution to the assignment; Choose a communication format that best supports your argument and select the intended audience; and Communicates clearly and with a style that supports the purposes of the intended audience

#### (ASSESSING) What did I learn from this assignment?

- Determine whether information satisfies the research; Draw conclusions based upon information gathered; Determine probable accuracy by questioning the source of the data, the limitations of the information gathering tools or strategies, and the reasonableness of the conclusions; Integrate new information with previous information or knowledge; Select information that provides evidence for the topic

Source: *Principles of Macroeconomics*, USCGA

#### Figure 4. Principles of Macroeconomics: Country Report Project

These assessments from a variety of courses are necessary to make conclusions and recommendations about the success of advancing IL skills across four years in the Management major. The long-term goal is to

extend IL development in other courses across all majors, and to specifically include core courses and required upper division courses. This will allow the USCGA to deliver a

comprehensive process for development and assessment of IL skills.

**Table 5.** Spring 2018 and fall 2018 IL Assessment Results

IL OUTCOMES	IL SKILLS CHARACTERISTICS	Learner's Self-evaluation	Teacher's Evaluation
		RESULTS	
<b>1. Know</b>	Determines the nature and extent of information needed	D = 20% C = 80%	C = 80% E = 20%
<b>2. Access</b>	Efficiently and effectively accesses information sources	D = 20% C = 80%	C = 80% E = 20%
<b>3. Evaluate Sources</b>	Critically evaluates information sources	D = 20% C = 80%	C = 70% E = 30%
<b>4. Evaluate Content</b>	Critically evaluates information content; Considers impact on student's prior knowledge, value system, and future direction in life	D = 25% C = 75%	C = 70% E = 30%
<b>5. Use</b>	Uses information found to accomplish a specific purpose	D = 20% C = 80%	C = 80% E = 20%
<b>6. Ethically Legally</b>	Understands the economic, legal, and social issues surrounding the acquisition and use of information	E = 100%	E = 100%

D - Developing, C - Competent, E - Exemplary

Source: Management Department, the U.S. Coast Guard Academy

## 7. Conclusions

The Management Department at the USCGA recognizes the challenge of today's research; it is critical to know how to find, organize, and evaluate the validity of information available. IL exercises allow students to learn how to select the best information for their research projects. The USCGA IL educational competences are based on ACRL outcomes. Through specifically designed IL strategies, the faculty established the learning environment that encouraged students to explore the unknown sources of information. The faculty and specially trained librarian staff are expected to provide guidance and to monitor students' progress throughout four years of instruction.

Curriculum was structured to introduce IL learning opportunities from a freshman level to a senior level. The six-stage IL process was developed to enable students to master IL skills. Those stages include *defining, locating, selecting, organizing, presenting, and assessing*. Achieving proficiency in IL requires development of fully integrated IL strategy into the curriculum's content, structure, and sequence of coursework.

The USCGA faculty members are responsible for making sure that cadets are learning while efficiently utilizing all available IL resources. The IL assessment initiative includes both direct and indirect means of assessments. In addition to indirect classroom assessment activities that are being conducted



within a specific course, the USCGA library is planning to initiate a new direct and standardized assessment process across all majors. The goal of this instrument is to maintain the quality of IL education process at the USCGA over time. The assessment and feedback process is a key part of IL development. With assignments tailored to target specific IL level, instructors can then evaluate students based on these benchmarks and compare the self-evaluation with the teacher's evaluation. The feedback on IL skills development can include a meeting with a faculty member or a simple e-mail with comments regarding deficient areas. Additionally, the faculty members note where the students' self-evaluations are significantly different from the teacher's evaluation. If those differences are substantial, students are informed of where they under or over self-assessed relative to instructor's evaluation and why.

As stated earlier, the faculty are also responsible for tracking the assessment process to make final decisions whether students are adequately progressing. In addition to using the assessment for individual student development, the instrument can also be used for assessment of IL skills progression across the major. When conducted across multiple courses taught by several faculty members, this assessment could provide a sample size large enough to evaluate the strengths and weaknesses of IL advancement across the curriculum. It also allows students and their academic advisors to track development of IL skills as the students progress through the major.

The importance of incorporating IL instruction within each course of any academic program serves as a complement to library's IL instruction and assists with meeting the academic standards for the IL proficiency. The IL strategy that was developed benefits the students by advancing them from *developing* to *exemplary* level based on the ACRL standards. This paper demonstrates how to

develop confident, self-directed, and independent lifelong learners. The academic faculty, together with the librarian instructors, face an increasing responsibility to adopt the IL structure to facilitate progressive advancement of IL through specially designed assignments, term papers, and research projects. Becoming information fluent makes individuals successful in their studies and prepares them for their lifelong learning as they acquire skills required for navigating information to their best advantage. Other academic programs interested in improving IL skills instruction can adopt the IL development process discussed in this paper.

This paper contributes to the IL literature by arguing that the all above issues discussed are critical for the development of effective IL program at the college level. The authors argue that academic institutions that support IL must recognize that IL instruction must provide numerous resources needed to support an IL initiative. We also support that resources for IL should consist of fiscal responsibility, personnel support, technology, and services. Faculty and librarians must be supported to provide effective IL instruction. They need to develop a curriculum in collaboration, including professional development opportunities and incentives. In addition, it is helpful if there is also a culture of IL evident in other aspects of campus life. All of these contextual characteristics of the institution's IL program should be considered in the institution's strategic, operational, and assessment plans.

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