

## **Accounting and Finance Education for Future Deck Officers**

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### **ABSTRACT**

This article surveys established practices at maritime universities to determine various curricular models used to deliver financial accounting and financial management instruction to future deck officers. Two major factors, limited space in the deck officer's curriculum for accounting and finance courses and the need to use exercises and applications with a maritime focus, emerge. These two factors influence course delivery. A discussion of an appropriate learning environment to enhance the educational experience of the cadets is developed. Pedagogical considerations pertaining to delivering financial accounting and financial management instruction are presented. The relevancy of selected course topics is highlighted. A concluding statement is offered that calls for a value-added instructional model to teach financial accounting and financial management whereby basic principles and concepts are presented sequentially and knowledge is acquired in a cumulative fashion.

### **1. Introduction**

A critical understanding of accounting and finance principles is essential for professional development and advancement. However, this is not adequately appreciated by many educators who prepare cadets (or in some institutions students are addressed as midshipmen) to become deck officers. Financial accounting and financial management expertise is considered by some individuals to be on the periphery of the requisite knowledge base essential for future deck officers. This view is reinforced by many individuals during the cadets' academic years, which are geared toward passing the national licensing examinations. The pass rate for the license examination represents a valid short-term measure for institutional and individual success and is a situation in

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common with the education of other professional students in actuarial sciences, engineering, the law and public accounting who are required to take standardized license examinations. However, this short-term measure should be put in its proper context; that of serving as a prerequisite for longer-term career achievements.

The professionally naïve young men and women who are preparing for sailing careers fail to grasp the complexities and requirements of the profession they plan to enter. This is understandable given the fact that, for many, they are lacking in experience, are not part of a network of successful professionals and have, for the most part, yet to clarify their professional aspirations. Their views will be tempered eventually by developing relationships with faculty and maritime practitioners who will impart knowledge concerning the successful development of a maritime-related career. Thus, initially, future deck officers equate a successful sailing career with nautical science in terms of effectively moving a vessel from the port of debarkation to the port of embarkation rather than developing the expanded understanding that vessel deployment must be accomplished within the parameters essential to the vessel owner's financial well-being. Deck officers will develop a deeper appreciation for the business aspects of vessel operations by learning about accounting and finance. This expanded knowledge is especially desirable because it enables graduates to fulfill leadership roles within maritime enterprises. For instance, an appreciation for bunker cost, crew salaries and cost of supplies and equipment should be reinforced during the cadets' educational program so that the financial implications affecting vessel operations and subsequent corporate profitability are understood. It is only through the accounting and finance courses that cadets will realize the issues of ship finance, shareholder value and the ability to raise capital for expansion programs. Vessel owners will tend to rely on those employees who are sensitive to thin profit margins and financial pressures; and reward them with increased responsibility and professional advancement opportunities. It should be emphasized, that for maritime enterprises, technical business knowledge is not a substitute for maritime experience, but a complementary component which contributes to the foundation required for senior management positions within the maritime business sector.

The purpose of this paper is to identify the accounting and finance course offerings at United States maritime educational institutions and discuss the creation of an effective learning environment and pedagogy as well as the selection of appropriate subject material to prepare deck officers for their profession. This conceptual focus should address the demands of both initial licensing as well as career progression. Financial accounting and financial management expertise is essential for deck officers who desire to advance their careers. Arguing that a higher percentage of the curriculum should be devoted to financial accounting and financial management courses is not the intent. Teaching financial accounting and financial management should emphasize the importance of these concepts for future deck officers as they develop their careers. The support of nautical science faculty is essential to develop the requisite awareness on the part of the cadets as to the complementary role that accounting and finance courses play in the preparation of licensed deck officers.

## 2. Accounting and Finance Education at Maritime Universities

Maritime schools in the United States recognize the importance of providing a certain level of business education to deck cadets. Financial accounting and financial management subjects may be included as part of this effort which may also provide instruction, mostly of a survey nature, in management, human resources, marketing and international business. The centrality of the business related instruction is, at times, considered questionable. Nautical science courses often take precedence in curricular discussions and decisions.

Administrators and faculty at maritime academies have developed various curricular approaches with respect to accounting and finance education (Table 1). Maine Maritime Academy, Massachusetts Maritime Academy and Texas Maritime Academy at Texas A&M University at Galveston do not require any accounting or finance courses for their deck cadets. California Maritime Academy requires one three-credit course in financial accounting and the Maritime College of the State University of New York requires one three-credit course in financial accounting and one three-credit course in financial management. The United States Merchant Marine Academy requires one three-credit course combining both financial accounting and financial management topics. The Great Lakes Maritime Academy requires two four-credit financial accounting courses as well as one four-credit financial management course.

Accounting and finance instructors at maritime schools teaching accounting and finance courses are faced with an enormous challenge. Their colleagues teaching in traditional business baccalaureate programs have established a tradition of a minimum of two accounting principles courses and at least one financial management course in the curriculum. Table 1 represents the difference between accounting and finance offerings at the seven maritime educational institutions in the United States; it does not reflect the differences between maritime deck programs and traditional undergraduate business programs. The difference between these two types of educational institutions is understandable given their respective strategic missions. However, maritime faculty do need to secure a place in the curriculum for these courses and articulate the relevancy of this area for educating cadets preparing for their professional careers. The value of the educational experience, with the potential for subsequent career advancement, makes a convincing argument that room should exist in the curriculum for accounting and finance courses. Thus, a well delivered course is crucial. It is, therefore, essential to develop an appropriate learning environment, select suitable pedagogy and construct an instructional model containing course topics that engages the cadets.

One should realize that the cadets are being educated as deck officers and not either as accountants or financial managers. Given their professional interests and orientation two major points are worth considering: 1.) practical exercises trump theoretical lectures and 2.) practical applications related to the shipping industry and personal financial planning add value to the learning experience. With respect to these points, the exercises and applications should have a maritime focus. Typically, this focus is lacking in the textbooks used in traditional undergraduate business programs. Exercises and

applications related to accounting for marine equipment, time value of money for dry dock operations, cost/benefit analysis for deferred shipboard maintenance, tax treatment analysis for establishing a legal residence in a particular state, currency exchange risk exposure and budgeting income and expenses as well as retirement planning given the uncertainty of a full year's employment are examples that have relevancy for the cadets.

**Table 1: Accounting and Finance Education at United States Maritime Educational Institutions<sup>1</sup>**

Institution: Major	Required Course(s)	Course Description(s)	Credits	Year(s) Scheduled	Reference
California Maritime Academy: Marine Transportation	BUS 100 Accounting Principles I: Financial	The objectives, basic theory and methods of financial accounting. Principles within which accounting functions. Measuring and reporting financial position. Measurement and reporting of income, cost and revenue. Prerequisite: None. Postrequisite: BUS 101, MGT 300	3	sophomore	www.csum.edu 7 May 2003
Great Lakes Maritime Academy: Deck Officer Program	ACC 121 Accounting Principles I	This course covers basic principles and procedures in accounting for both a service and merchandising business. It includes the accounting cycle, manual accounting systems, petty cash, bank reconciliation, receivable, inventories and payroll. Prerequisite(s): ASSET scores of 40 in reading and 38 in numerical.	4	sophomore	www.nmc.edu/ maritime 7 May 2003
	ACC 122 Accounting Principles II	Second semester accounting continues with plant and equipment, partnerships, corporations, bonds, cash flow statements, statement analysis, and manufacturing accounting. Prerequisite(s): ACC 121	4	sophomore	
	FINC 322 Financial Management I	Helps the student develop the knowledge of the environment, goals, and techniques of financial management; emphasizes both investment and financing decisions: incorporates control techniques including ratio analysis, budgeting, and forecasting; includes time value on money, bond and stock values, the use of operating and financial leverage, capital budgeting techniques, and the cost of capital.	4	junior	
Maine Maritime Academy: Marine Transportation Operations and Small vessel Operations	None	n/a	n/a	n/a	www.maine maritime.edu 7 May 2003

**Table 1: Accounting and Finance Education at United States Maritime Educational Institutions<sup>1</sup> - (continued)**

Maritime College State University of New York: Marine Transportation	ACCT300 Financial Accounting	Accounting concepts from the point of view of the firm investor and management. Procedures to facilitate the understanding of the recording, summarizing, and reporting of business transactions. Principles of asset valuation and revenue, and cost recognition. Prerequisite: none	3	sophomore	www.suny maritime.edu 7 May 2003
	MGT409 Financial Management	An introduction to the financial management of corporations, including statements, ratio analysis, current assets and liability management, capital budgeting, stock and debt financing. Prerequisite: ECON111 and ECON112	3	junior	
Massachusetts Maritime Academy: Marine Transportation	None	n/a	n/a	n/a	www.maritime.edu 7 May 2003
Texas Maritime Academy at Texas A&M University at Galveston: Marine Transportation	None	n/a	n/a	n/a	www.tamug.edu 7 May 2003
United States Merchant Marine Academy: Marine Transportation Maritime Operations and Technology; Logistics and Intermodal Transportation	DB 310 Finance and Accounting	The principles of accounting essential to the development of a good accounting information system will be studied. The methods of collecting financial information and their processing to produce the financial statements necessary for good management control will be developed. The journal, the ledger, trial balance, adjustments, depreciation, statement preparation and analysis will be covered. Budgeting and cost controls are developed. This course will familiarize cadets with the concepts and terminology of business finance: DCF, NPV, IRR, break even analysis, capital budgeting and cost of capital will be introduced. Microcomputer software and business oriented simulation will be used.	3	Sophomore or junior	www.usmma.edu 7 May 2003
<sup>1</sup> Source: Prepared by author based upon a review of the educational institutions' web sites.					

This effort to use practical exercises and applications takes time and follows a heuristic approach that will lead to continuous improvement. Fortunately, a number of academic journals offer insights for teaching excellence. The growing recognition of the importance of teaching and learning in the management sciences has been explosive, which can be seen in the proliferation of academic journals devoted to business and management pedagogy (Bilimoria and Fukami, 2002). For instance, *The Journal of Economic Education* ([www.heldref.org/html/body\\_jece.html](http://www.heldref.org/html/body_jece.html), June 3, 2003), *Journal of Education for Business* ([www.heldref.org/html/body\\_jeb.html](http://www.heldref.org/html/body_jeb.html), June 3, 2003), and *Journal of Accounting Education* ([www.elsevier.com/inca/publications/store/8/4/0/](http://www.elsevier.com/inca/publications/store/8/4/0/), 12 May 2003) are refereed journals dedicated to promoting excellence in teaching and stimulating research in economics and accounting education internationally. These journals provide forums for exchanging ideas, opinions, and research results among educators around the world. Additionally, other professional and scholarly journals not specifically devoted to teaching do include either special features or special issues on discipline-specific teaching. Since 70% of the professors who responded to the 1989 Carnegie Foundation faculty survey indicate that teaching represents their primary interests (Boyd, 1990), faculty should review available resources to develop and deliver their accounting and finance courses using effective approaches.

The sole purpose of teaching is to facilitate learning (Cross, 1988). Faculty need to develop instructional objectives providing focus and direction, establishing testing guidelines and conveying teaching intent to the students (Gronlund, 1985). This effort clarifies the educational objectives for the course being delivered. Two distinct taxonomies identifying educational objectives have been presented in the literature (Bloom, 1956; Dooley and Skinner, 1977). Bloom's effort identifies six educational objectives; knowledge of specifics, comprehension, application, analysis of elements, synthesis and evaluation. Dooley and Skinner offer eight educational objectives; acquire knowledge, develop concepts, understand techniques, acquire skill in use of techniques, acquire skill in analysis of business problems, acquire skill in synthesis of action plans, develop useful attitudes and develop mature judgment and wisdom.

These educational objectives are important to consider when designing accounting and finance courses. Each taxonomy recognizes the need for knowledge acquisition, application, analysis and synthesis. Faculty can incorporate these objectives when designing their courses. The process of course design can be considered in terms of a sequence of major activities: Establishing the learning environment; developing the pedagogy; and selecting the course topics. These three activities are discussed in the following sections.

### **3. Learning Environment: Creating the Milieu**

A learning environment should be created to facilitate the educational experience. The learning environment consists of three components: social (instructor, advisor, academic administrators, students, library staff, clerical staff); physical (classroom, instructor's office, library, other locations where a student or students explore the subject matter

either independently or with others, computer technology, audio and visual tools); and values (freedom of speech, reasoned dissent, academic integrity, access to educational resources, freedom to discuss relevant issues, collaborative learning; cooperative learning, engaged learning, problem-based learning, active learning).

The established learning environment should be sufficiently flexible to accommodate a variety of learning styles. Kolb (1984) identifies four student learning styles: accommodators (concrete experience and active experimentation – trial and error methodology); divergers (concrete experience and reflective observation); convergers (abstract conceptualization and active experimentation); and assimilators (abstract conceptualization and reflective observation).

Other learning styles include collaborative learning, cooperative learning, engaged learning, problem-based learning and active learning. Various learning styles may rely on either individual or group learning. Individual learning styles may include engaged, problem-solving and active learning. Engaged learning occurs when students are active participants in assigned project-based and authentic learning activities that enhance the learning process as instructors use a series of probing, relevant questions to guide students to solve assigned problems. Problem-based learning calls on prior knowledge, provides new knowledge and builds sufficient redundancy to ensure knowledge is understood and can be applied to situations (Bridges, 1992). This learning style uses a systematic series of procedures to solve a problem by group action (Bridges, 1992; Pregel, 1994) or individual effort whereby students demonstrate understanding of material; and do not respond with rote, memorized answers thus building critical thinking and reasoning skills, advance creativity and independence while providing to the students a sense of ownership of their work. Active learning takes place when students talk to other students directly and the instructor is not in the middle of each discussion point.

Group learning styles may include collaborative and cooperative learning as well as variations of the individual learning styles identified above. Collaborative learning takes place when students work together to explore a significant issue or create a meaningful project. Cooperative learning may be defined as a structured, systematic instructional strategy in which small groups of students work together towards a common goal (Cooper *et al*, 1993). The students are individually accountable for their work; and the work of the group as a whole is assessed.

#### **4. Pedagogy: The Art and Science of Teaching**

Pedagogy is a systematic approach to teach a course and includes three components: course content (specific topics covered during the term); graded requirements (quizzes, examinations, projects, case studies, exercises, classroom presentations); and processes to acquire subject knowledge (written communications, oral communications, individual and group projects, class discussion, analytical skills, case studies, exercises, study aids, discussion seminars, ethical issues, critical thinking skills).

Whereas the instructional objectives are established when developing the learning environment, the learning objectives are identified when developing the pedagogy for the course to be taught. Teaching and, thus, pedagogy transcends lectures presenting course material. The beginning point in preparing a course for delivery is to consider the relevancy of the subject material in terms of both the discipline under study and the cadets' need to acquire the knowledge. Contemplating how to answer the question, "Why should I study accounting and finance?" would serve the instructor well when developing the course. A thoughtful, focused response to this question provides the foundation for developing the course and stimulating student interest. Possible responses may include the following:

- accounting and finance are considered a language of business enterprises;
- the subjects provide the knowledge needed by first mates, captains, business managers and executives for the budgeting process, cost control and capital expenditures;
- an understanding of financial reports is needed to invest intelligently in the stock, futures and bond markets; and
- pensions tend to be defined contributions; requiring an understanding of financial reports to build higher value pensions.

The instructor can then articulate expectations and explain the importance of non-content oriented material such as written and oral communication skills, analytical skills, critical thinking skills, and ethical issues as it impacts on developing mastery of accounting and finance principles.

## **5. Selection of Course Topics: Relevancy is Critical**

The selection of specific course topics should provide an integrated treatment for the accounting and finance disciplines and thus consists of two components: accounting (role of accounting, balance sheet, income statement, accounting records and systems, non-current assets and depreciation, inventories and cost of sales, revenue recognition cash flow statement, financial statement analysis) and finance (role of financial management, tax environment, financial environment, time value of money, financing and investing through securities markets, risk and return, capital budgeting).

An appropriate guiding principle for selecting course topics may be to provide a "real-world" emphasis for the cadets. To establish the relevancy of the educational experience the accounting and finance topics should relate to maritime business operations as well as other business disciplines. An added benefit to this approach is that business oriented thinking will be an outcome of the educational experience. The course material should be explained in terms of its relevancy to the cadets for their career objectives and professional choices. This will deepen the connection between teaching and learning.

When identifying course topics the instructor should realize that a careful selection of topics that provide an effective, value-added approach is superior to covering far too many topics in the limited time that is available. Subject material and related concepts should be introduced in a logical, sequential fashion with sufficient overlapping of

material during consecutive class sessions to enhance cumulative learning. The use of real world practical exercises and applications reinforces both the relevance of the subject matter and the concepts and theories presented in the textbook and during the lectures. Continual application of theory to realistic problems provides an important grounding in the subject matter. Consideration may be given to using a consistent point of reference, perhaps the annual report of a publicly traded maritime business enterprise for the cadets to understand such issues as accounting for stock options, financial ratio analysis and cash flow implications.

Absent a careful selection of course topics difficulties may ensue. Potentially, one of two ill-fated results may occur. The instructor may establish the objective to cover the universe of traditional accounting and financial management topics reducing the time spent on each topic in an effort to “rush” through the material. Conversely, the instructor may omit certain key accounting and/or financial management topics to “save time” thus resulting in the transmittal of information with gaps that detract from the learning experience. Either approach detracts from the learning experience. As a result, cadets either fail to fully develop a mature understanding of the concepts and practices in the former approach or have such gaps in their understanding of the topics that their knowledge base is substantially weakened in the latter approach. In either case, a potential implication is that either promotion opportunities are limited or promotion beyond the individual’s financial competence may result.

## **6. Conclusion**

A systematic approach used to offer accounting and finance courses will add immeasurably to the cadets’ learning experiences. The process should be sensitive to two major factors, limited space in the deck officer’s curriculum for accounting and finance courses and the need to use exercises and applications with a maritime focus, and involve the creation of an appropriate learning environment, the identification of the pedagogy and the selection of the course topics. Each step in the process should be developed in an explicit fashion that is communicated in direct language to the students.

Teaching accounting and financial management should follow a “building block” analogy whereby basic principles and concepts are presented sequentially and knowledge is acquired in a cumulative fashion. This pedagogical approach necessitates that the pace of instruction is commensurate with both the available time for instruction as well as the available time spent by the cadets to absorb the new material and reinforce their knowledge by working on practical exercises related to their chosen profession. The goal is to create the optimal environment for cumulative learning within the restricted time available given overall curricular requirements to prepare licensed deck officers. This approach will prepare cadets well as they assume their licensed appointments and discharge their responsibilities with respect to budgeting, payroll accountability, contractor bids, time value of money, equipment purchases and cost control for shipboard operations.

This more considered pedagogical approach calls for the instructor to combine two initiatives to enhance the learning experience. One, the careful selection of topics is essential to provide the optimal environment for cumulative learning within the restricted time. Two, overlapping new information transmitted during each class session with concepts and principles introduced during a previous class shows the importance of the selected topics to the cadets.

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