

ACTIVE LEARNING AND ASSESSMENT: A STUDENT GUIDE TO USING CONCEPT MAPPING IN FINANCIAL ACCOUNTING

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ABSTRACT

New AACSB standards require innovative, engaging teaching strategies and active learning methodologies to improve student learning. Concept mapping is recommended in this paper as an effective teaching and learning tool that can support these standards because it requires students to think actively about what they have learned, and allows faculty to directly assess this learning. While the effectiveness of concept mapping as a teaching and learning tool is discussed in the literature, there is little in the way of a published student guide to teach accounting faculties and students how to use the skill effectively.

The purpose of this paper is twofold. First, we discuss how concept mapping can help accounting educators meet the new AACSB's standards by using this innovative teaching tool to engage students in an active learning methodology and evaluate student learning outcomes. Second, we provide a step-by-step student guide to concept mapping, based on instructional design strategy, for a typical introductory financial accounting course. While forms of business structure are used to illustrate the technique, the guide can be customized for other accounting concepts or ideas. Teaching notes are also included to assist instructors in planning and introducing concept mapping and in using the student guide.

Key words: Concept mapping, active learning, assessment tool, meaningful learning, financial accounting, and student guide

INTRODUCTION

In April 2013, the Association to Advance Collegiate Schools of Business (AACSB) approved the Blue Ribbon Committee on Accreditation Quality (BRC) recommendations to update accreditation standards. The revised AACSB standards retain “assurance of learning” (AOL) guidelines (AACSB, 2013a), which recommend direct assessment measures in which students demonstrate skills or knowledge rather than indirect measures (Martell and Calderon, 2005). The BRC’s report also reduces the number of standards from 21 to 15, with greater emphasis on themes of innovation, impact, and engagement. AACSB accredited schools (approximately 716 in almost 50 countries) are currently implementing or modifying AOL measurement tools and other pedagogical procedures to meet these relatively new and more rigorous guidelines (AACSB, 2013b).

The AACSB requires that schools define learning goals before assessment or measurement techniques are implemented, and encourages both program and course embedded measurement processes to determine if goals have been achieved. AACSB guidelines also encourage active learning, feedback, and direct assessment. Schools are currently experimenting with a variety of measurement tools such as individual course assessment rubrics, simulations, senior exit exams, and other learning measures that fit their unique programs, with emphasis on student learning and direct assessment.

Coupled with the assessment change, the AACSB’s current learning and teaching standards (numbers 8 through 12) emphasize “curricula [that] facilitate and encourage active student engagement in learning.” These standards discuss the importance of frequent, prompt, and accurate feedback on student performances to “document innovative and/or effective teaching practices that have had significant, positive impact on student learning” (AACSB, 2013c). In addition, the AACSB calls for an active and creative learning environment, with timely feedback to foster and motivate learning.

Concept mapping is recommended in this paper as an innovative classroom teaching and learning tool that directly supports these AACSB criteria, by enhancing the development of students’ thinking skills through meaningful learning activities. There is much support in the accounting literature on the effectiveness of concept mapping as a teaching and learning tool, but no published guide to introduce or effectively transfer the use of the skill in an accounting course.

As a result, the purpose of this paper is twofold. First, we discuss how concept mapping can help accounting educators meet the AACSB’s active learning and assessment criteria. Second, we provide a step-by-step student concept mapping guide for use in a typical introductory financial accounting course, using instructional design strategy as the foundation. The illustrated instruction in the paper describes the process of drawing a concept map of forms of business structure (sole proprietorships, partnerships, and corporations), although the instructor is free to choose any viable set of concepts for the task. Teaching notes are included to assist instructors in planning and introducing concept mapping and using the student guide.

What is Concept Mapping?

Concept mapping is the art of externalizing knowledge, through drawings or diagrams called concept maps. Concept maps are the physical evidence of the process, showing the mental connections and association patterns that reflect student learning (Angelo and Cross, 1993; Croasdell, et al. 2003). It has also been described as a framework for the learner and educator to mentally interact with the subject matter (Canas, 2003).

Concept mapping has proved useful in achieving meaningful learning, as opposed to rote learning. Often students are limited in developing their ability to think in more meaningful ways or are inexperienced in how to relate new concepts and ideas to previous knowledge. This pattern worsens over time with students becoming less capable of learning and applying more complex knowledge and concepts. This is a phenomenon not unique to accounting. Novak (1998) observed:

The more we learn and organize knowledge in a given domain, the easier it is to acquire and use new knowledge in that domain. The curse is that when we try to learn new knowledge in a domain where we know little, and/or what we know is poorly organized, meaningful learning is difficult, usually time consuming and tiring. Too often, we may escape the challenge by resorting to rote learning, even though we know that what we learn will soon be forgotten and it will not be of value in future learning (24).

In the simplest form of concept mapping, a concept map is just two concepts or ideas connected by a linking word (Novak and Gowin, 1984). Figure 1¹ illustrates a simple concept about the ideas “Connecting Concepts” and “Accounting.”

Ausubel’s assimilation learning theory (1963, 1968) heavily influences Novak’s earlier work and provides the theoretical framework from which concept mapping developed. Assimilation theorists suggest concept maps help students organize and bridge the gap between what they know and newly obtained knowledge. The underlying learning theory of concept mapping is the symbolic representation of how students process information and organize knowledge in their cognitive (thinking) domain. In simple terms, the elements of a concept map relate to how cognitive knowledge is developed structurally by a learner through: hierarchical structure, progressive differentiation, and integrative reconciliation (Ausubel, 1963, 1968; Novak and Gowin, 1984). These sophisticated learning theories can be simply described and illustrated in the context of accounting knowledge.

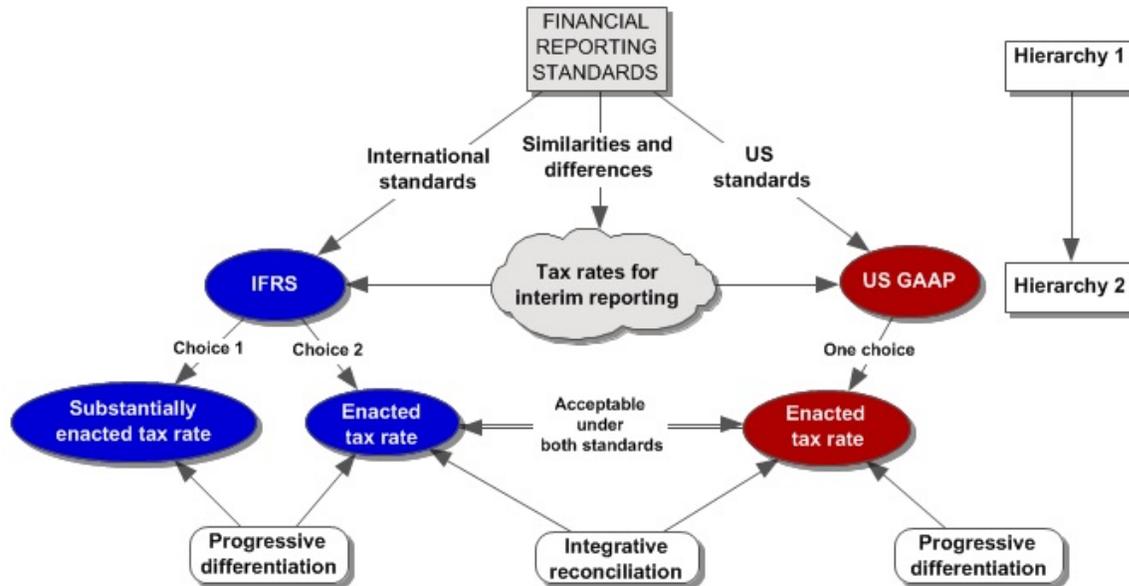
Hierarchical structure means a learner recognizes knowledge as part of an inclusive framework, such as IFRS and US GAAP financial reporting standards. Progressive differentiation means a learner develops more ideas and concepts as knowledge deepens, such as explaining the interim reporting tax rate rules under IFRS and US GAAP. Integrative reconciliation means a learner perceives interrelationships, such as connecting the similarities or differences between these IFRS and US GAAP rules. These learning theories are illustrated in Figure A and each is an important element of meaningful learning.

LITERATURE REVIEW

The literature on concept mapping as an active learning and assessment tool is substantial and well-documented. It centers on the various ways in which concept mapping helps students organize and build knowledge frameworks, promotes students’ thinking about relationships between Jonassen 2000; Feltovich et al., 1993; Anderson-Inman and Zeitz 1993; Todd and Kirk 1995; Schau and Mattern 1997; Anderson-Inman and Horney 1997; Beissner 1992; Novak, 1998; Mintzes et al., 2000; Maas and Leaby 2005; Leaby et al., 2010).

¹All numerical Figures referenced are included in the Appendix.

FIGURE A
A Concept Map Illustrating the Underlying Learning Theory and the Similarities/Differences in Tax Rates Used for Interim Reporting (US GAAP and IFRS), Using the Software Inspiration®



Literature more focused to this paper first begins with a discussion of the accounting education research related to concept mapping. This is then followed by the link between AACSB and concept-mapping and assessment techniques. Finally, the literature on instructional design strategy, form, and content of a successful student guide are discussed.

Accounting Education Research

Articles link concept mapping with accounting education, active learning, and/or assessment. These can be classified into two themes: using concept mapping as a learning tool on particular topics, and using it as a way to assess what students have learned. The nature of this tool is that it can be used simultaneously to do both.

Maas and Leauby (2005) discussed the usefulness of concept maps as an enabling technique for meaningful learning by developing a set of ready-to-use concept maps for instructors to use to help students learn basic financial accounting concepts. Simon (2007) used instructor prepared maps in a financial theory course to guide course concepts by asking students to voluntarily create their own concept maps on their understanding of the material; instructors then evaluated and returned the maps to highlight gaps in understanding. They noted students found concept mapping helpful to the learning process. Others studies used classroom research experiments in introductory accounting, intermediate accounting, and auditing courses, to help students learn (Hackner and Tschudi, 1994; Irvine et al., 2006; Shimerda, 2007), to break down more difficult accounting

concepts (Chen et al., 2003; Trebucq and Noel, 2006), or evaluate what students learned as part of an exam (Leauby and Brazina, 1998).

Several studies utilized empirical research designs. Maas and Leauby (2005) found the results on two exams in an introductory accounting course were statistically significant (higher) when concept mapping was integrated into the learning process. Chiou (2008) studied the effectiveness of concept mapping using control (traditional instruction) and experimental (facilitated by concept mapping) groups in an advanced accounting course. Here, the experimental group outperformed the control group and he reported that students had positive comments about the learning benefits of concept mapping. Leauby et al. (2010) conducted a similar experiment using control and experimental groups for an entire semester of an introductory accounting course. While they did not find any statistically significant difference between the two groups, students in the experimental group expressed positive comments about its usefulness as a learning tool when they were surveyed.

AACSB Standards and Concept Mapping

Concept mapping is well-suited to support and fulfill the new AACSB standards. This innovative tool promotes AACSB core values and requirements for active learning, student feedback, and AOL assessment.

The literature is rich in examples to show that concept mapping involves active learning (see Angelo and Cross, 1993; Novak and Gowin, 1984; Todd and Kirk, 1995; Schau and Mattern, 1997, Beissner, 1992). Feltovich et al. (1993) describe it as an “active, self-engaging, transformational interaction” that enhances learning. This type of learning supports AACSB core values and standards. For example, core value two states “the school maintains a collegiate environment in which students, faculty, professional staff and practitioners interact and collaborate in support of learning, scholarship and community engagement” (AACSB, 2013a. p. 5). Standard number 10 supports this core value by encouraging “student-to-faculty and student-to-student interactions appropriate to the program type” and requires schools to document how “interactions are assessed for impact and quality” (p. 36). Standard number 13 suggests “curricula facilitate student academic and professional engagement” which “occurs when students are actively involved in their educational experience, in academic and professional settings and when they are able to connect these experiences in meaningful ways” (p. 40).

Concept mapping provides an ideal classroom tool to provide student feedback as well, because a concept map externalizes what a student knows and provides an observable record of the student’s conceptual schemata and starting knowledge points (Angelo and Cross, 1993). As noted earlier, AACSB standard number 12 notes schools must “document innovative and/or effective teaching practices that have had significant, positive impact on student learning.” In our opinion, providing timely feedback is critical to the learning process as it allows students to know how well they learned materials and where improvements are needed. Since concept mapping provides an observable record of what a student knows, this provides an excellent way for effective student feedback in real-time.

Finally, concept mapping provides an effective mechanism for AOL assessment. Many of the accounting-related articles used concept mapping for some form of assessment. AACSB standard number 8 states schools must “describe the processes for determining and revising learning goals, curricula management, and assurance of learning.” AOL places significant emphasis on integrating classroom tools that directly measure students learning. Because concept mapping

externalizes what a student knows about given concepts, the instructor is able to quickly assess how well and to what extent a concept is learned. Maps provide physical evidence of the AOL process and provide an excellent classroom evaluation tool for direct assessment.

Assessment Techniques for Concept Maps

To fulfill the AACSB AOL standard, concept maps can be used as tools to evaluate student learning. Scoring concept maps was first proposed by Novak and Gowin (1984), based on the structure and components of the maps. The scoring model in Table 1 aligns to the underlying learning theory illustrated in Figure A. Here, the hierarchy equates to hierarchical structure; valid propositions, branching, and specific examples illustrate progressive differentiation; cross links equate to integrative reconciliation. Greater weight is given to multiple hierarchical levels and cross linking (integrative reconciliation).

TABLE 1

Novak and Gowin 1984 Scoring Model

Scoring element

Each level of hierarchy equals 5 points

Each valid proposition equals 1 point

Each branching equals 1 point

Each specific example equals 1 point

Each cross link equals 10 points

This assessment approach is time consuming because every concept map is unique. Some researchers have tried to simplify or modify this assessment process (Ruiz-Primo and Shavelson, 1996; Gouveia and Valadares, 2004; Valadares and Graca, 1998), while others combine methods, using the Novak and Gowin 1984 scoring model along with a comparison to an expert's map (Rye and Rubba, 2002).

Maas and Leuby (2005) point out that there is a natural fear of grading these assignments (therefore reluctance to assign), because concept maps do not fit traditional grading rubrics. For this reason, the authors suggest a qualitative approach by grading work on a "big picture" basis, without getting into how many ideas or concepts each map represents. The instructor could ask the following questions: Does the map portray an informational picture of the required elements of the task? Do the ideas and concepts appear to represent valid items? Are there incomplete or invalid ideas and concepts represented (points might be deducted for these)?

The more specific the measure, the higher the reliability and validity of the assessment measure (West et al., 2000). On evaluating the reliability and validity of concept map assessment, the literature indicates that structural and holistic measurements are not as strong; as raters become more experienced, reliability increases (West et al., 2000). From the vantage point of psychometrics,

concept maps fall within the range of acceptable measures of validity and reliability (West et al., 2000; Shavelson and Ruiz-Primo, 2000). Regardless of what assessment model is used, the concept mapping process is an assessable and viable tool to fulfill the AACSB AOL standard.

Instructional Design Strategy, Form, and Content of a Successful Student Guide

Designing the instructional message is critical once an instructional strategy (such as concept mapping) is chosen. Morrison et al. (2007) address three important elements in the design of an instructional message. The first element is development of a pre-instructional strategy to prepare learners for the intended instruction. The second is incorporating strategies for signaling the structure of the message through words and typography. The third is using pictures and graphics effectively in delivering the instructional message.

To incorporate the first element of pre-instructional strategies, the authors suggest using pre-tests, behavioral objectives, overviews, and advance organizers to prepare learners for the intended instruction. Advance organizers facilitate learning by relating it to knowledge previously learned and provide a connecting link to bridge the learning gap. Advance organizers sync with the underlying learning theory of concept mapping.

The second element identifies strategies for signaling the structure of the message through words and typography. These signals provide the interface or interaction between the learner and instructor to ensure the instructional message is effectively communicated. Signaling strategies include such items as lists, comparisons or contrasts, temporal sequence (events connected by time or specific sequences), cause and effect, and definition and example.

The third element for designing effective instruction is use of pictures and graphics in the instruction to aid in the interpretation of new material and to help students acquire new knowledge. For example, representational pictures and graphics show students what a concept map actually looks like (i.e., what students learn), interpretational pictures and graphics illustrate familiar topics, and organizational pictures and graphics provide step-by-step creation of the desired activity.

Ditson, et al. (1998) teach the art of electronic concept mapping to teachers, using the software Inspiration[®]. The criteria, form, and content of this model, interwoven with the criteria for the instructional message, are organized into step-by-step sequential sections from start to finish. The overall sequencing framework in the guide illustrates the elements of instructional design suggested by Morrison et al. (2007).

Maas and Leaby (2005) offer helpful instructional elements to ensure learning the skill. The authors urge faculty to ensure students practice concept mapping in familiar territory, such as a concept map of favorite music, TV shows, videos, or movies, before attempting to transfer the skill to a discipline-specific task. This is consistent with Morrison et al. (2007), in which advance organizers and interpretational pictures and graphics are suggested in the pre-instructional phase.

SUMMARY

In summary, it is apparent from the literature that concept mapping has been used in accounting courses with different results for varied reasons. Many have used it as a way to assess (evaluate) whether learning occurred, with or without linkages to student improvements; others have used it to plan the learning process, with or without linkages to follow up exercises. A common theme that emerges, however, is that it is considered a useful tool for student learning and/or assessment in a variety of different accounting settings.

It is also apparent that AACSB standards for active learning and student engagement and feedback align extremely well with concept mapping. Concept map assessment may be more time consuming than traditional classroom assignments, but it provides two important AOL elements simultaneously in real-time: external output of what a student knows (the student learning aspect) and direct assessment of student learning (the physical evidence/evaluation of learning aspect).

The literature also discusses the importance of developing instructional strategies, such as advance organizers or step-by-step procedures, to introduce students to these new ideas. It also emphasizes the use of pictures and graphics, such as organizational, representational, or interpretational pictures and graphics, to facilitate the learning process. Ditson et al. (1998) followed the elements of effective instructional messages identified by Morrison et al. (2007), and Maas and Leaby (2005) suggested instructional messages such as advance organizers and the importance of practice in familiar territory; however, neither offer an actual student guide.

THE STUDENT GUIDE (See APPENDIX)

This section discusses five elements considered important for developing a successful student guide, whereas the Appendix sets out the details of an actual student guide for an introductory financial accounting course. The five elements for a successful guide are drawn from the elements of instructional messages identified by Morrison et al. (2007), interwoven with the Ditson et al. (1998) model and the guidelines set forth by Maas and Leaby (2005). They include:

(a) an overview of the purpose of the guide.

An overview helps prepare students for the instruction that follows and includes a representational picture for what is to be learned (Morrison et al., 1998; Ditson et al., 1998). There are three main purposes of a guide: (1) to help students structure and organize financial accounting knowledge; (2) to help students create their own personal understanding of financial accounting concepts; and (3) to learn the skill of concept mapping and deepen knowledge of accounting concepts and interrelationships.

(b) background, including pre-instruction, advance organizers and signaling strategies.

This element ensures sufficient background information on the importance of concept learning, the nature of concept mapping, and the benefits to be derived by students. Advance organizers (Morrison et al., 2007; Maas and Leaby 2005) are used to further prepare the learners for instruction; three subsections relate to this pre-instructional strategy. The first is visual and written text on concept mapping and the components, with an analogy to music, a familiar topic (the advance organizer). The second describes the benefits of concept mapping and how this skill is useful, using written text and lists (signaling the structure of the message). The third discusses how concept mapping can identify differences or mistakes in learning, using music again as the familiar topic (the advance organizer), and explaining how reconciling differences might be applied to financial accounting. This is an important step to prepare students for the forthcoming instruction.

(c) instructional guidance (step by step) from familiar to unfamiliar.

This element uses organizational pictures (Morrison et al., 2007; Ditson, 1998) and includes a five-part step-by-step illustration of concept mapping, transitioning from a familiar topic (music - the advance organizer) to an unfamiliar topic (forms of business structure - the intended discipline-related instruction), including space for students to practice the skill. These events enable students

to transfer the newly-acquired skills of mapping music concepts (familiar) to mapping financial accounting concepts (unfamiliar). It involves five steps, related to the hierarchical structure map, with steps 1-4 repeated in step 5 when applied to a discipline-specific task.

Step 1 starts with a main idea about a familiar topic (music), adding broad ideas that fit into the main idea (such as favorite singers, favorite past-times, and favorite music outlets). As shown in Figure 2, this defines the hierarchical structure of the map; the first part of the underlying learning theory.

Step 2 expands this by elaborating on one of the other broad ideas (such as favorite singers). As illustrated in Figure 3, this adds progressive differentiation (learning theory) to the idea of favorite singers, the second part of the underlying learning theory.

Step 3 completes the map by applying the previous approach to the other two broad ideas (favorite past-times and favorite music outlets). As illustrated in Figure 4, this adds additional progressive differentiation (learning theory) to these ideas.

Step 4 allows students to create their own music map in familiar territory. This is critical so they are given time to practice the skill on familiar ground before branching out into the desired discipline-related task.

Step 5 applies the practice to a discipline-specific task, which is a concept map of the attributes of forms of business structures. It repeats the same order of the steps used in the music map practice, with the instructor's assistance.

First, students develop a list of ideas about the forms of business structure and then add broad ideas (such as sole-proprietorships, partnerships, and corporations). Similar to the music map, Figure 5 defines the hierarchical structure of the business structure forms map. Second, similar to Figure 2 of the music map, students provide detail on one of the broad ideas such as sole proprietorships. This adds the underlying learning theory of progressive differentiation, as illustrated in Figure 6. Third, like Figure 4 in the music map, students are shown how the map can be expanded by applying the previous approach to partnerships (Figure 7). The completed map (Figure 8) shows all attributes of the final business structure form - corporations. Fourth, instead of students creating their own [music] map, students are first asked to consider how the forms on business are related (i.e. what similarities exist?) This taps into the most complex aspect of the underlying learning theory called integrative reconciliation. As illustrated in Figure 9, two similarities are noted for discussion: (i) all business forms are related to the economic entity assumption, and (ii) sole proprietorships and partnerships share similar attributes (other relationship might be appropriate as well). This shows how concept mapping can help students synthesize concepts and not miss "big picture" connections.

(d) logical organization.

This emphasizes logically-sequenced instruction (Kemp et al., 1998). A number of key headings and subheadings are integrated into the guide taking students from one section to the next.

(e) visual cueing.

This includes visual cueing and diagrams to capture students' attention. Representational, interpretational, and organizational pictures are used throughout the guide to show students what they learn, relate the skill to something familiar, and provide the step-by-step instruction to successfully execute/transfer the skill to discipline-specific tasks.

The completed guide provides students with the basic steps and skills to understand how to build a concept map using sound instructional design strategy principles. Active learning and student engagement in the learning process also results. Students will likely have learned more about forms of business structure doing this map than reading about it in a text.

TEACHING NOTES FOR IMPLEMENTATION

Maas and Leuby (2005) provide a comprehensive eight-step² approach to using concept mapping in an introductory accounting class. The authors also provide twelve already-constructed concept maps covering introductory financial and managerial accounting. Instructors can review these maps, and use them as stand-alone classroom examples or to develop or tailor assignments for individual or group work.

With the introduction of the student guide in this paper, the eight steps can be consolidated more easily. Step one is critical and requires advance planning and a willingness to set aside time for students to learn and apply the skill. Steps two to four introduce students to concept mapping, its benefits, and asks students to create familiar maps. These three steps can be combined into one by assigning the student guide as a homework assignment and asking students to complete their own music map.

As reinforcement, faculty might also demonstrate how to draw a concept map in class, before students have read the guide. A practical approach is downloading the Inspiration[®] software (comes with a 30-day free trial) in class and spend fifteen minutes illustrating how to build a simple concept map. Students could also be instructed to download the software and produce their required music maps using this approach. An online search reveals different mapping software vendors, with most software providing tutorials and free trials. There are also many online tutorial postings using different types of mapping software (e.g., YouTube).

Steps five and six involve assigning a task and completing an in-class group mapping activity. Maas and Leuby (2005) used the income statement providing some structure on what students should include. Since students are relatively inexperienced in the skill at this point, structure goes a long way in helping them organize thinking and planning (out-of-class) to ensure a successful outcome (in-class). This can be done in a number of ways. For example, we implemented an in-class group mapping activity without the use of technology by dividing students into groups, giving them flip-chart paper taped to the walls, and plenty of colorful Post-it[®] notes. We found the Post-it[®] note option was an excellent alternative to the mapping software as the students were highly engaged and had fun creating maps on the purpose, components, limitations, and usefulness of an income statement. Exhibit 7 in Maas and Leuby (2005) is a great illustration of how good an outcome can be produced. The last part of the eight-step process included grading the maps on a qualitative basis (step 7) and asking for student feedback (step 8).

The “flipped classroom” model, where more hands-on work is done in class and lecture-type materials are offered online, also works well with this tool. By posting the student guide online and asking students to create practice maps out-of-class, more class time can be devoted to an engaging in-class activity with learning benefits. Faculty can also post more online information and guidelines to help with specific mapping assignments.

²The prior section listed five elements necessary for creating a study guide. These eight steps helps to operationalize the use of the guide.

After completing the student guide exercise, it is recommended to continue to reinforce the use of the skill. For example, we required students to map an entire chapter or specific topic as homework. This enables students to experiment with mapping. The assignments do not need to be graded closely because the process itself is useful to learning course material; however, we subsequently provided an instructor-created version of the assignment, so that students could evaluate their own maps and identify invalid or incomplete concepts. The extent to which instructors choose to do this is only limited to the amount of time spent in reviewing the maps or helping students improve them.

Like other class assignments, we also found a lower grade weight assigned to these homework projects is often not enough incentive to fully engage all students. One approach to overcome this is including mapping exercises in exams (heavier weight) in lieu of essays. Once students learn of this approach, their investment in concept mapping significantly improves.

The “International Conference on Concept Mapping”³ has been held five times in the last decade. The conference posts all its materials online, which is very helpful for educators wanting to learn more about concept mapping. While the materials cover many disciplines, there are hundreds of papers/resources available. With the development of the student guide and more resources available since concept mapping entered the accounting discipline, planning and implementing a concept mapping exercise is easier than ever.

LIMITATIONS AND CONCLUSION

This paper discusses how concept mapping supports many facets of the new AACSB Blue Ribbon Committee on Accreditation Quality standards and assurance of learning (AOL) guidelines relating to active engagement of the student, innovative engaging pedagogy and direct assessment of learning. While the benefits of this enriching tool may seem obvious, there are some costs and constraints.

A major constraint is the amount of advance planning time instructors set aside, as well as trade-offs in classroom time to cover other course content. Accounting educators already feel significant pressures to cover more material and develop more skills within limited class periods. While the student guide can teach students how to initially use this tool, it cannot replace the classroom time needed to practice and reinforce it.

A second constraint is that it does not fit traditional scoring rubrics for assessment. Although clearly assessable, faculty must be willing to customize a rubric fitting the instructional objectives. Because concept mapping externalizes how a student organizes his/her own knowledge, faculty must become comfortable with the fact that there can be a wide variety of valid maps.

A third limitation relates to the availability of technology. Concept mapping software makes learning the skill easier and faster. Technology resources for this task compete with pressing educational needs to keep classrooms/computer labs fitted with universal technology rather than software for specific disciplines or tasks. In addition, the cost to students might be burdensome if a course requires both traditional materials and mapping software, although free or trial-use mapping software is widely available to mitigate this burden. Also, as suggested in the teaching notes, the use of Post-it[®] notes works very well.

³A search using the conference title reveals many useful websites.

Accreditation standards demand proof of continuous quality-improvement in our education process through innovative engaging teaching strategies, active learning methodologies, teacher/student engagement and feedback, and direct assessment of learning outcomes. This paper illustrates how concept mapping is a well-suited learning tool that can fulfill all of these requirements, provided we are willing to set aside the time.

The paper provides a student concept mapping guide for a typical introductory financial accounting course, which can be customized to any accounting course and modified to include any accounting concepts or ideas. In addition, it provides a student guide that uses instructional design strategy, form, and content guidelines as its foundation. This can serve to introduce an active, engaged learning pedagogy into the course, aligning with the recent AACSB standards revision project preferences for active and direct assessment of learning. Finally, it provides teaching notes to help use the student guide and to introduce concept mapping in the classroom.

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APPENDIX
STUDENT GUIDE TO CONCEPT MAPPING
IN AN INTRODUCTORY FINANCIAL ACCOUNTING COURSE

SECTION 1AN OVERVIEW OF THE PURPOSE OF THIS GUIDE

The purpose of this student guide is to learn a new skill called “concept mapping.” Concept mapping externalizes what you know about concepts and their interrelationships. It will help you develop a personal understanding of financial accounting concepts.

When you complete your review of this guide, you will be able to:

1. Explain the meaning of a concept map and concept mapping.
2. Understand the components of a concept map and how components fit together.
3. Draw a concept map of something familiar.
4. Draw a concept map of basic financial accounting concepts.

SECTION 2WHAT IS A CONCEPT MAP AND CONCEPT MAPPING?

Concept maps are drawings or diagrams that show your mental connections and patterns of association on a major concept or between concepts learned. In other words, it externalizes what you know about particular concepts and ideas and how you connect them together. In its simplest form, a concept map is two concepts connected together by linking words. For example, we can make a simple concept map about the concepts “connecting concepts” and “accounting.”⁴

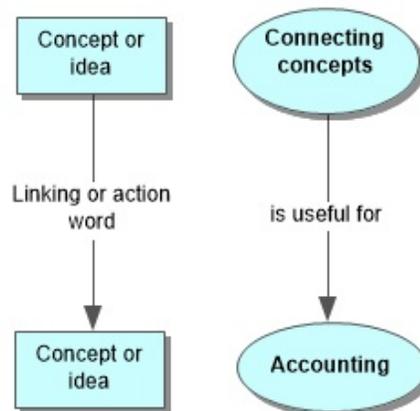


Figure 1. A simple concept map is illustrated, using the software Inspiration[®]

In Figure 1, the linking words are “is useful for”, which tie together the ideas “Connecting concepts” and “Accounting.” While “action” linking words are helpful to understanding your ideas, don’t let that get in the way. It’s more important to get the ideas down in a logical framework.

⁴The examples in this student guide use the software Inspiration[®]. However, you can just as easily draw it on a piece of paper.

The underlying learning theory of a concept map is its symbolic representation of how you process, organize, and learn information – you do this differently than someone else. By working collaboratively on a concept map, you can see how your instructor and your classmates organize information. This will improve your own knowledge of the subject.

The unique thing about a concept map is that each student’s map of accounting concepts is different. For example, the word “music” is just a label that each of us identifies with certain artists, labels, CDs, people, activities, events, etc. Each of us has a different “music map” but all will be right – that’s the really neat thing about concept maps. We don’t have to all draw the same map. However, if music concepts were important to successfully passing this financial accounting course, each of us should try and get as close as we can in our agreement as to what music is, and yet still have the flexibility to organize the information in a way that is most useful.

The actual process of drawing a concept map is called “concept mapping.” Concept mapping can help you organize information in financial accounting. It externalizes your perceived knowledge of concepts through drawings or diagrams. It helps your instructor understand how well you understand particular concepts or ideas.

SECTION 3

WHAT ARE THE BENEFITS OF CONCEPT MAPPING?

Everyone can benefit from learning this skill. Today’s successful organizations are knowledge organizations because they capitalize on their intellectual resources. Did you know that many businesses use mapping techniques to organize and understand the exploding wealth and complexity of information or as a creative process for problem solving? Consider the way you search your favorite web sites for more details on a subject by a browser search. Internet information is organized somewhat into semantic networks that formalize the structure of knowledge into a hierarchy - logically from broad to specific. Concept mapping is a form of semantic networking like the Internet.

Some of the benefits include:

1. Understanding how you learn and what you have learned.
2. Developing a better process to study in a constructive way by actively thinking about course concepts.
3. Summarizing what you learned in class, or from reading or working through an assignment.
4. Identifying mistakes in your knowledge framework in time to correct.
5. Establishing your starting point of knowledge for a particular subject or idea.
6. Breaking down more complex knowledge into manageable chunks.
7. Promoting your ability to think holistically (perceiving a whole related set of concepts) and creatively (perceiving a set of concepts in a different way), instead of bits of information which are seemingly unrelated.
8. Gaining practice in a skill that can help you in other courses during your formal education.
9. Developing a skill used in business and industry.

Concept mapping is a highly creative, engaging, and enriching skill. Your ability to draw a good concept map depends on how well you assimilate course concepts or how creative you see them

differently. There is not just one way to draw a map of business structure forms, although some may be better and more organized than others – some might show mistakes. Your instructor’s understanding of business structure forms is likely more organized and detailed than yours. This allows your instructor to more easily see how concepts fit together because his/her knowledge framework is likely better organized. Thus, you will find that the better you organize course concepts, the easier it will be to construct a map and remember new ideas. Thus, by going through a process of drawing your first concept map, it will seem difficult at first. You will get better as your knowledge improves and becomes more organized. You will also identify what you don’t know. It’s far better to know now what you don’t know than on the test!

SECTION 4

HOW DO YOU GET STARTED?

Let’s start with a familiar concept mentioned earlier – music. What ideas come to mind when you think of the concept “music”? A good way to start is to simply make a list of all of the ideas that come to mind. For example, let’s say you associate the following ideas or concepts with music:

- Taylor Swift
- Live concerts
- Karaoke with friends
- IPOD and ear buds
- Pandora
- Usher
- Shakira
- YouTube
- Weekend parties

The list provides information, but it is not that meaningful. How do each of these items relate to each other? For this information to be useful, we need to put it into some type of framework, or hierarchy. This will help to visualize how the pieces relate to the concept music, how each item relates to each other, and make it easier to recall when needed. This is where concept mapping is useful.

Let’s take this list of music ideas. If I started to plan out a concept map, I would first start with a main idea and then expand from broad to more specific ideas. I might make my main idea simply “My Music.” Under this main idea, I might start with broad categories that reflect the range of items in my list such as: Favorite Singers, Favorite Past-times, and Favorite Music Outlets:

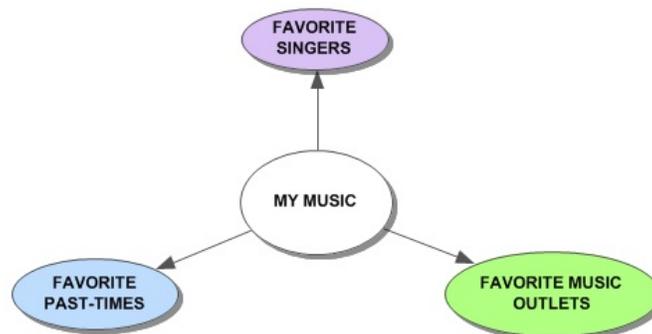


Figure 2: Step one. My music map with main idea/broad categories identified.

Now I can go back and sort my ideas under the broad categories. For example, under Favorite Singers, I place Taylor Swift, Usher, and Shakira. This is a way of better organizing my list into a type of hierarchy, making my music ideas easier to remember and more useful when recalled.

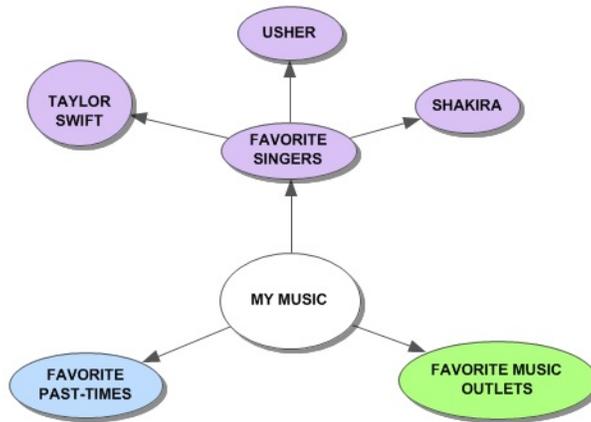


Figure 3: Step two. My music concept map with favorite singers detailed.

Now I can complete the map by filling in the remaining two categories. Under Favorite Past-times, I put: Weekend parties, Karaoke with friends, and IPOD with ear buds. Under Favorite Music Outlets, I put: Live concerts, Pandora, and You Tube.

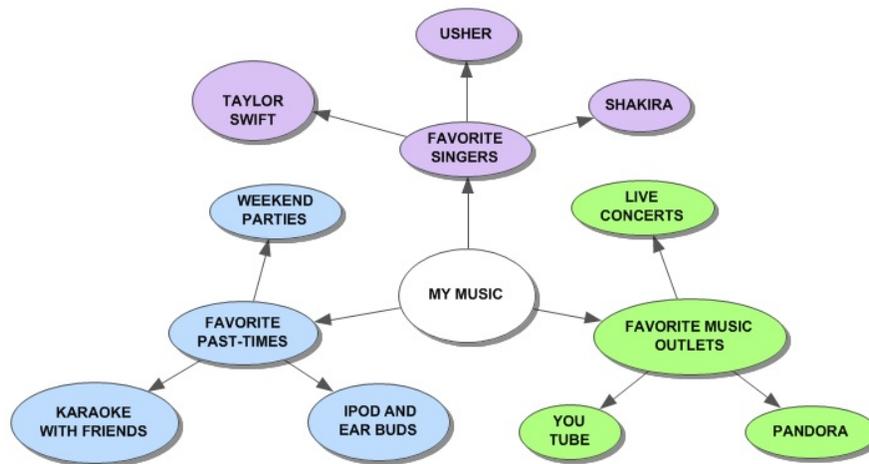


Figure 4: My completed music concept map with all items detailed.

I didn't worry about adding action words right now. The ideas about "My Music" are already much better organized than when I started. The framework makes sense to me. I can always add action words later. Now it's your turn. Make a list of 8-10 ideas about music which make sense to you.

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

What is your main idea? What broad categories do your ideas fall under? List these below:

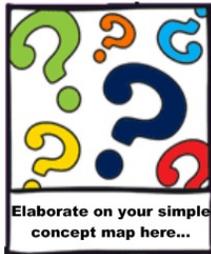
Main music idea (broadest)	
Broad categories that your ideas and concepts fall under (you can have more than 3)	
1.	
2.	
3.	
4.	

Using the space below, prepare your music map following the steps below:

STEP 1: Identify your main idea and the three or more broad categories for your ideas. Follow the example in Figure 2, but customize it to your music theme.

STEP 2: Now try and sort the ideas under just one of the broad categories, like Figure 3.

STEP 3: Now try and finish your music map, completing the detail on the remaining broad categories you identified like Figure 4.



Your finished music map with all broad categories identified and detailed.

Now your music map is done. It reflects how you organize your thoughts on music! Good work! Let's share some of the music maps you created.

SECTION 5

HOW DO YOU TRANSFER THIS SKILL TO FINANCIAL ACCOUNTING?

Let's assume your instructor assigns the task of preparing a concept map on business structure forms. How do you start?

STEP 1: What is the main idea of your map? Let's just call the main idea: Business Structure Forms. What are the three principal business forms learned in class? Sole proprietorships, partnerships, and corporations. Let's draw this much of the map.

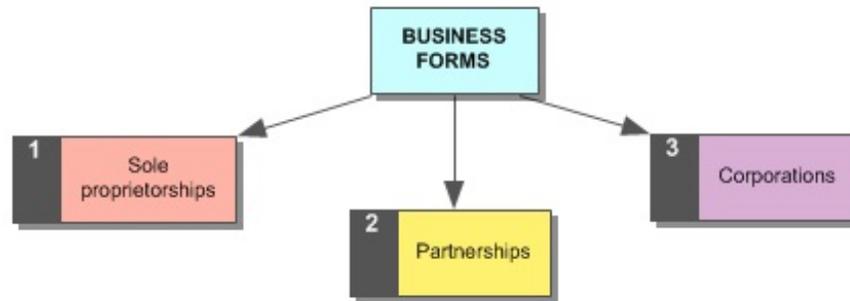


Figure 5: A business forms concept map with broad categories identified.

STEP 2: What are some concepts and ideas that fit under each of these main concepts? Let's start with sole proprietorships. What concepts or ideas are associated with sole proprietorships? How about these: simple to form, owner-controlled, limited capital resources, tax advantages, and unlimited liability. OK – let's add these ideas under number 1: sole proprietorships – don't worry about action linking words for now.

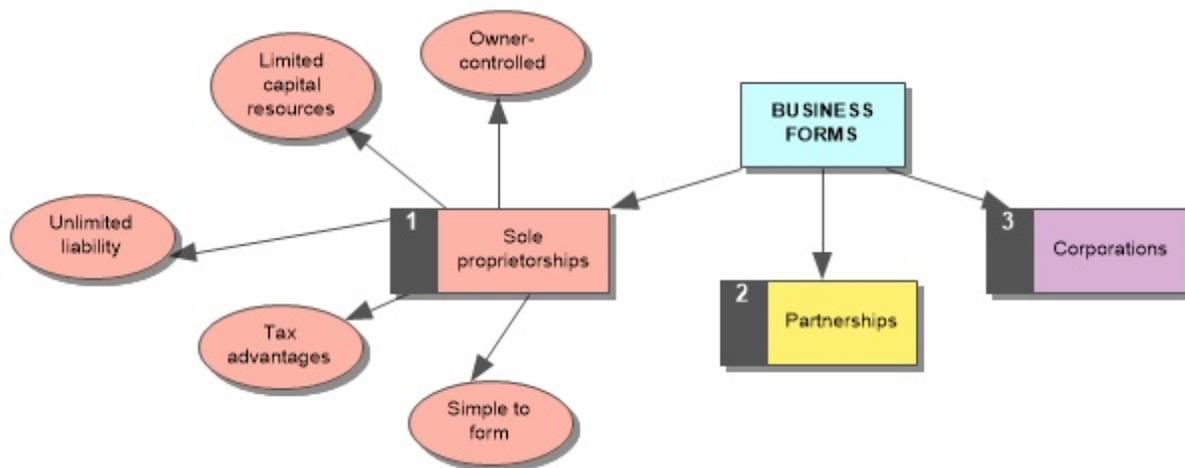


Figure 6: A business forms concept map with broad categories; sole proprietorships detailed.

STEP 3: What are some concepts and ideas that fit under partnerships? How about these: simple to form, broader skills and resources, shares control, tax advantages and unlimited liability. OK – let's add these ideas under number 2: partnerships.

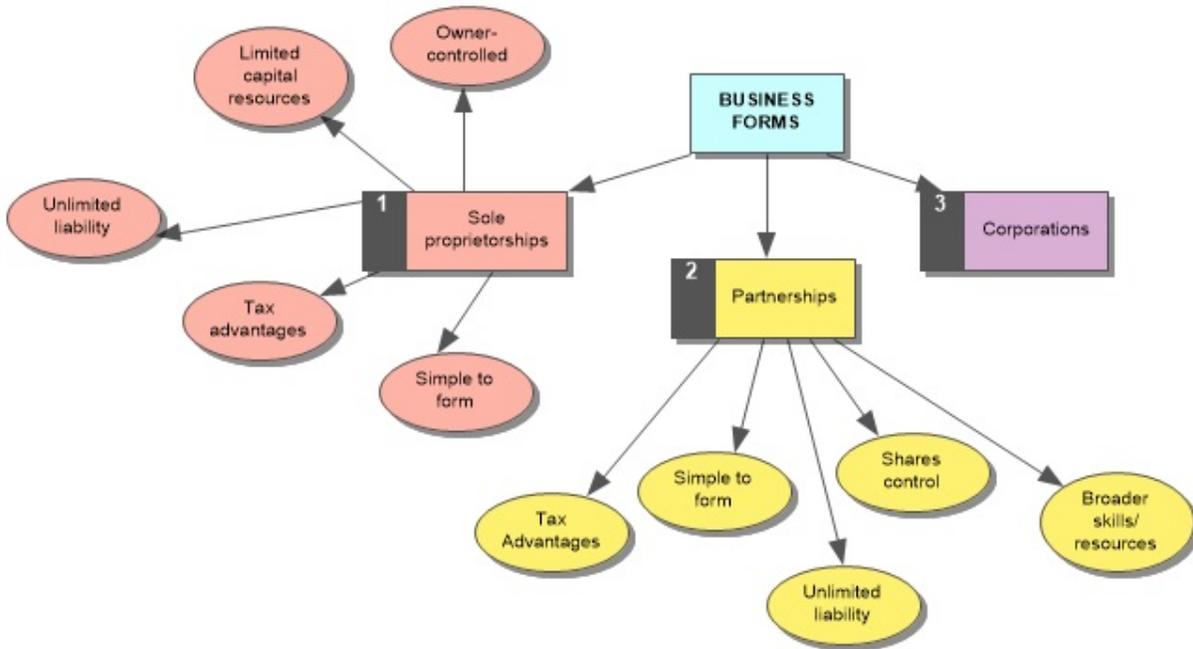


Figure 7: A business forms map with broad categories identified, sole proprietorships and partnerships detailed.

STEP 4: Your map is coming together and is flush with great concepts about business structure forms! Let's finish it off with ideas and concepts about corporations: easy to transfer interest, easier to raise financial resources, tax disadvantages, limited liability and hire professional managers. OK - let's add these ideas under number 3: corporations.

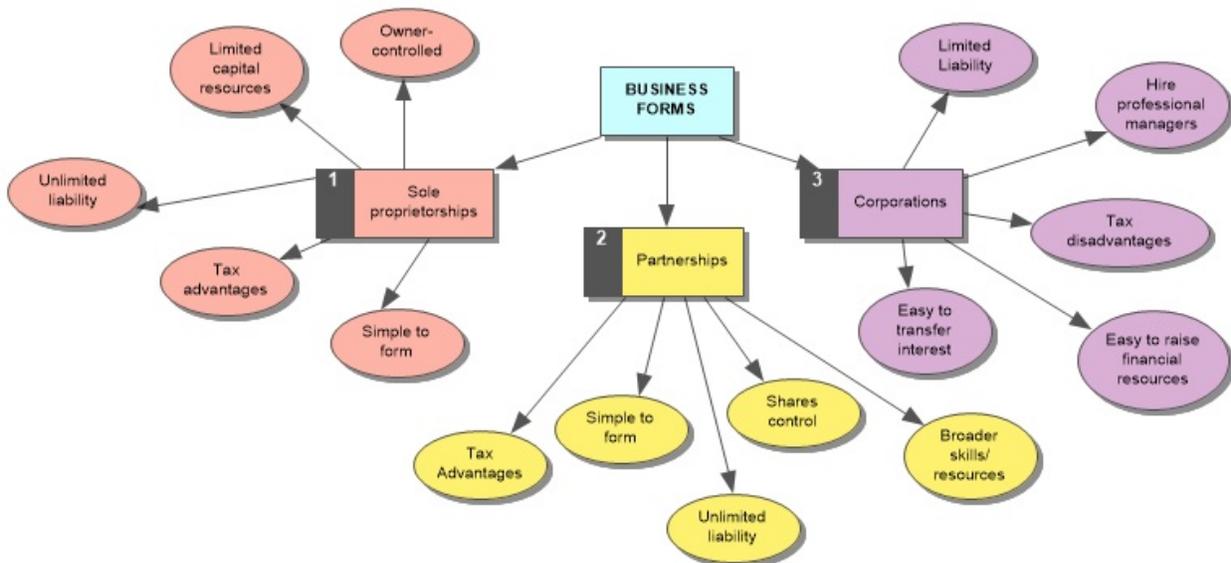


Figure 8: A business forms concept map with all categories identified and detailed.

STEP 5: Now let’s add something new, which you did not do on your music map. How are some of these concepts and ideas related to each other? How are they similar? The economic entity principle is one common idea that relates to all of the business forms – the business is separate from its owners. We can show this interrelationship by drawing an arrow from the main idea “Business Structure Forms” up to a new hierarchy called “Economic Entity Principle.” Second, sole proprietorships and partnerships have common attributes even though they are different business forms. Let’s acknowledge these similarities (tax advantages, unlimited liability, and simple to form) by connecting these concepts down to a new link called “Similar Attributes.” Your ability to see connections or interrelationships among ideas indicates a better knowledge framework.

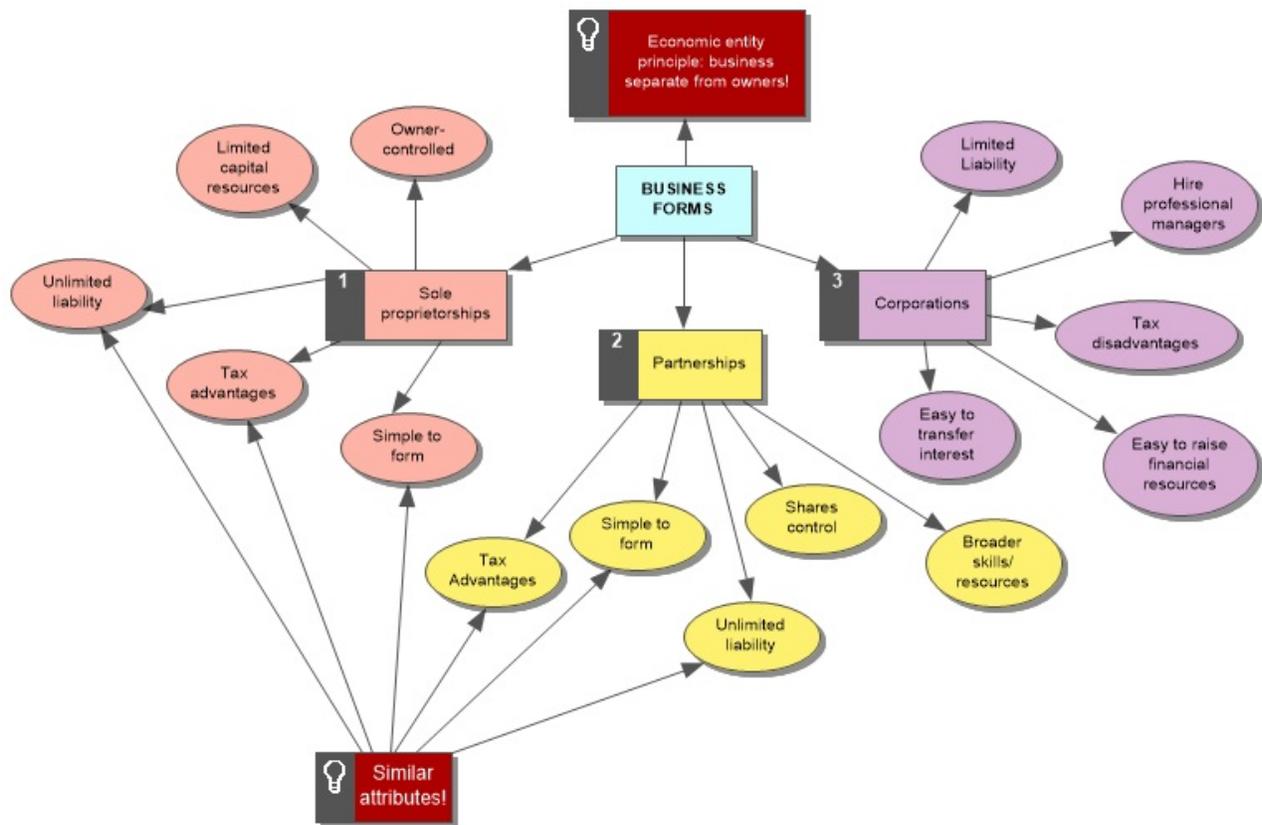


Figure 9: A completed business forms concept map with business forms identified and detailed; interrelationships noted.

You’re done! Look how rich your map is with ideas organized in a logical framework! Practice makes perfect! You could improve on your map by adding linking words, but it looks pretty good right now. You could expand the map by adding more concepts and ideas that relate to each idea. For example, under “Corporations” and “Easier to raise financial resources,” you could add “Sell stock or bonds.” Under “Partnerships” and “Shares control,” you could add “More than one owner.” You might have learned more about business structure forms from making this map than reading the book!