Journal of Strategic Management Education 1(1).

Tinkering in Class: Using the Tinker Toy Exercise to Teach First Mover Advantages and the Resource-Based View

Russell W. Coff
Emory University

Donald E. Hatfield[1]
Virginia Polytechnic Institute and State University

Abstract. We suggest how an experiential exercise using building toys - such as Tinker Toys or Builderifics, can be used to teach students about the concepts of first-mover advantages and the resource-based view. The exercise requires the class to be broken up into teams. Each team is then assigned the task of building the tallest tinker toy tower they can in a short amount of time. After each team is allowed sequentially to attempt to build a tall tower, the class then discusses why later teams tended to do better than earlier teams at accomplishing this task. The discussion should revolve around the resource-based view concepts of rarity, imitability and substitutability, and the first-mover advantages (technological leadership, preemption, switching costs and buyer uncertainty) and disadvantages (free-rider effects, resolution of technological or market uncertainty, shifts in technological or customer needs, and incumbent inertia).

Key Words: experiential exercise, resource-based view, first-mover advantages

1. Introduction

The resource-based view (Barney, 1986; Penrose, 1959; Rumelt, 1984; Wernerfelt, 1984) and first-mover advantages (Lieberman and Montgomery, 1988) are two key, if often misunderstood, concepts taught in business policy or strategic management courses. The importance of these concepts clearly can be easily seen from the aftermath of many early movers in the Internet business efforts. As Lieberman and Montgomery (1998) argue, first mover advantages can be viewed from the perspective of the resource-based view.

1. We would like to thank our students who have given us feedback on this exercise over the years, and the numerous colleagues which have expressed to us their success in using this tool. Please address all correspondence to the second author at the 2007 Pamplin Hall, (0233) Pamplin College of Business, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061.

One reason why students (future managers) may have trouble grasping the intricacies of the insights from these perspectives is possibly the way in which they have been taught. Most faculty teaching strategic management or business policy have relied upon the case method or combining the case method with lectures. As essential as these approaches are towards teaching strategic management, there exists ample room for the use of experiential exercises. These exercises allow the students a chance to be more actively involved in the learning experience. This paper presents one such exercise which helps illustrate the key concepts behind first-mover advantages and the resource-based view.

Our use of the classic tinker toy exercise differs in its fundamental lesson and in its approach to the exercise than McNeely (1994) and other more traditional applications. We find the tinker toy exercise to be a great way to introduce students to a variety of issues taught in strategic management, but will focus on how it can be used to teach the resource based-view perspective of first mover advantages (Lieberman and Montgomery, 1998). Because the purpose of the exercise differs from previously suggested exercises involving tinker toys, the exercise must be run in a unique manner.

2. Teaching First Mover Advantages and Resource-Based View

The resource-based view (Penrose, 1959; Rumelt, 1984; Wernerfelt, 1984; cf. Mahoney and Pandian, 1992) is an important perspective in Strategic Management. Fundamentally, the resource-based view (RBV) assumes heterogeneous firms have different resources or capabilities that can lead to superior performance when a firm's resources are valuable, rare, costly to imitate, and non-substitutable (Barney, 1991). Lieberman and Montgomery (1998) argue that "the resource-based view (RBV) and first-mover advantage (FMA) are related conceptual frameworks that can benefit from closer linkage" (1998: 1122).

The Lieberman and Montgomery FMA framework argues that while first-mover advantages can be formidable, first-movers must also be wary of key disadvantages. The key mechanisms for FMA include technological leadership (learning curves, and R&D and patents), preemption of assets (preemption of input factors, preemption of locations in location in geographic and product characteristics space, preemptive investment in plant and equipment), switching costs and buyer choice under uncertainty. The FMA disadvantages include free-rider effects, resolution of technological or market uncertainty, shifts in technological or customer needs, and incumbent inertia. Put simply, later entrants may be able to imitate the first mover or respond to changed market conditions as they enter. In so doing, they may leapfrog past the first mover without incurring many of the costs laden on the initial entrant. By

integrating the RBV with the FMA perspective, we can focus on when FMA's might be more durable because later entrants cannot acquire resources critical to success in the market.

From a teaching standpoint, explaining to students these concepts in RBV and FMA are difficult for two key reasons: 1) confusing resources from RBV with strengths from the classic SWOT (strength, weaknesses, opportunities, and strength) analysis (Andrews, 1971; Andrews, Learned, Christensen, and Guth; 1965); and 2) the problem of unobservables in the resource-based view (Godfrey and Hill, 1995). SWOT analysis has been a classic tool since it was popularized by the Harvard Business School in the 1960s. SWOT analysis has become "strategy" to many faculty outside of the traditional business policy and strategy course. Thus, many students come into a strategy class believing SWOT analysis is strategy. Unfortunately, the approach does not emphasize resources that are valuable, rare and unavailable to rivals. Moreover, the concept of fit between the internal firm and external environment are often overlooked. The dynamic nature of strategy (for example, Miller's Icarus Paradox) is often forgotten in these lists - that is, a resource may not always be a "strength" (Miller, 1990). For example, IBM's corporate sales force was a strength for IBM in selling mainframes; however, it was a weakness when IBM attempted to enter into the personal computer industry. Too often managers and students fail to see the situational nature of a SWOT analysis. There is also difficulty for the user of SWOT analysis in developing the lists - the brainstorming technique used to develop items under the S, W, O, or T lack a theoretical basis and often become a contest to come up with more items under the column which would support the brainstormer's previously-held position. The resource-based view does not suffer from these limitations, however the student may confuse the two techniques. The use of the tinker toy exercise in class helps students focus on the issue of rareness, imitability, and substitutability key to the RBV and missing in SWOT analysis.

The issue of unobservables in the resource-based view creates added confusion for students. Many students come into class with a number of bias after having focused on finance and accounting. The intangible assets at the heart of strategy may seem squishy and thus less important. Yet this is the essence of the resource-based view. As Godfrey & Hill (1995:530) state "It is by construction impossible to assess the degree of unobservability of an unobservable, since by definition inimitable resources are unobservables (Barney, 1991)." Part of the purpose of the exercise is to give students a hands on experience with how intangibles can drive the performance of their "firms."

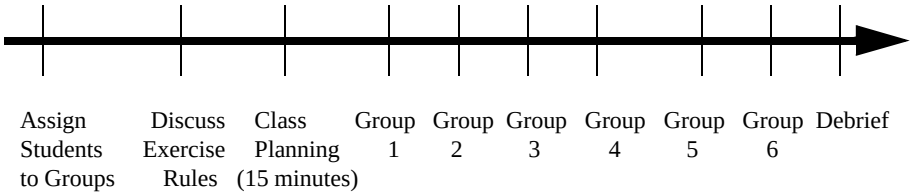
3. The Exercise

McNeely employs four sets of Tinker Toys for four simultaneously run groups. This is helpful when using the exercise as an icebreaker or on the first day of class. It can also be used in this way to demonstrate a variety of issues linked to strategy process (planning, decision-making, implementation).

However, our purpose is to demonstrate how this basic exercise can be used to teach about difficult problems in content strategy. Accordingly, we run the exercise in a sequential manner so some groups have an opportunity to observe others before executing the task. While it works best in a single classroom, observers can be used to employ this exercise in a distance learning televised environment. We have even put a tape of one exercise on a webpage for an on-line course.

The students are randomly assigned to groups. While the number of team members per group has little impact on the learning experience, the exercise requires enough groups to have a range of outcomes. Usually, having six groups is optimal. Each group is told that the winning team will be given some reward for building the tallest tinker toy tower in the building period. The class is given fifteen minutes to plan how they will build the tower, and then each group will take a turn to build their tower. Each group will be given 45 seconds for the actual tower building, although as short as 30 seconds has worked well. See Figure 1 for an exercise time line. All the non-building groups are allowed to watch the building group. Usually the later groups will build the taller towers - however, it is also common for some of the later groups to build towers which fall over.

Figure 1: Time line of Teaching



Typically, at least one group will ask to look at the tinker toys. Let them. This is part of the lesson that is being taught. Managers have to understand the output of their organization in order to design strategy; the general manager that can manage anything is rare, if she or he still even exists. You may or may not allow them to put the tinker toys together, and tear it back down. How the pieces can be integrated, the stickiness of the joints, and the balance of the

pieces are examples of tacit knowledge. During the debriefing, be sure to discuss with the students why they wanted to put the tinker toy pieces together. The rules for the exercise are as follows:

1. Each group is given the same 15 minutes to plan how to build their tower.

2. All pieces of the tinker toys must be separated before the competition, but each group may lay the pieces around where ever they wish.

3. The tinker toy tower must be free-standing. It may not rest on anything, or anybody. The groups may only use the actual tinker toys to build, not the box, nor anything not considered a tinker toy.

4. The first group to go will be decided at random. Each group will then follow immediately after the previous group has destroyed their tower.

5. Each group will have only 45 seconds to build their tower. They must cease building when time is called (time will be counted down when there is ten seconds remaining).

6. Breaking any tinker toy part will result in disqualification and the ire of the professor.

7. All groups may watch the building group.

8. The winning group, determined by the height of the tallest part of the tower, will get some form of predetermined reward.

After each group has had their turn, we write on the board what height the group was able to achieve. After all the groups have gone, the winning group gets their reward and everybody returns to their seat.

4. Debrief and Discussion

Usually, one of the last two groups will win.[2] During the course of the exercise subsequent groups are able to learn by observing mistakes made by the early movers. For example, most groups fail to assign a time-keeper even though it is clear that task is time constrained. Later groups can easily observe that this is an issue and it is a simple adjustment to assign this role.

However, not all aspects of performance are observable without hands on experience. Some groups are more skilled in working as a team or have more working knowledge of how stable the tinker toys are likely to be. These elements are harder to learn through observation of other teams. As a result, while later teams generally do better than early teams, even some of the later teams are prone to failure (towers that fall over, etc.).

In leading the subsequent discussion, we find the following questions to be particularly valuable:

1. How important was the planning to the winning group's success?

2. What could the other groups learn from the success of the winning group? Was there any unique strategy employed by the winning group?

3. Why did the non-winning groups "fail"? Was it bad strategy, poor implementation, or bad luck?

4. What is the role of luck in accounting for group success?

5. Was there a "first mover advantage"? How might one be created?

6. Given that earlier movers have a disadvantage in this exercise, what resources should a group which moves earlier possess?

7. How might this exercise be changed so that later groups do not "learn" from the earlier groups?

8. If a group could "patent" elements of the tower design, how could these be defined such that the "patent" could be enforced?

---

2. One of the co-authors uses Builderiffic toys because they are flimsy. Students assume that they will be more sturdy than they are and even after watching other groups, there is a high risk of falling. With either type of toy, some later ones still have their tower fall. This is an important point if some groups don't adjust adequately by observing others. This is the key element of tacit knowledge (learning by doing) that is hard to imitate.

9. What were the "resources" which allowed the winning group to be successful? Can these be easily identified? Can you patent resources or "unobservables"?

10. What "resources" would later groups wish to "purchase" from earlier groups, if they could?

11. Was the "dominant design" that emerged the best possible design?

12. How might the groups' performance change if they were to perform the exercise again?

13. How might the results change if the groups' memberships were randomly reassigned, and then the exercise was repeated with the new groups?

Learning Objectives

After completing this exercise, the student should be able to:

1. Discuss how a firm might create a first-mover advantage;

2. Explain the characteristics of a resource which yield superior performance; and

3. Apply the concepts of RBV and FMA.

5. Lessons Concerning the Resource-based View and First Mover Advantage

The key learning goal of this exercise is its ability to clarify the issues of the FMA and RBV. After all groups have had a chance to build a tower, the professor should de-brief the class. Specifically, the discussion should focus on why the winner was able to be more successful than the other groups. A number of issues may come up: for example, 1) leadership; 2) division of labor; 3) knowledge; and so forth. As each comes up, the professor should attempt to apply the RBV framework - question the class on what was unique, what was unimitable, and what was difficult to substitute about such things as leadership, division of labor, and knowledge.

As the conversation progresses, the role of timing should be injected. Hopefully, the students will be able to see the importance of imitation in explaining why innovators are not always successful (Teece, 1987 offers a nice table of first movers that were and were not successful). In order to be

successful, a group that goes early must either have unique resources or be able to hide their strategy from imitating followers. Since all groups have the same physical resources (the tinker toys), only their expertise (human resources), strategy, and group dynamics (organization) are unique.

5.1. Resource-Based View

During the debriefing, the students are questioned on why the earlier groups tended to build shorter towers, why some of the later groups' towers might have tipped over, and what might happen if this experiment was to be run again (with the same tinker toys or with some other material such as Builderiffics). To help the groups try to identify "resources", put up categories of resources on the board. These questions are aimed at trying to determine what the later groups had that the earlier groups did not, and what the groups' whose towers that fell-over did not possess. Another line of questioning should cover how might the experiment be changed so that earlier groups are more likely to win.

In this experiment, knowledge is usually the key difference. It may be knowledge about successful tinker toy designs (gained from other groups' experiments), knowledge about tinker toys, or knowledge about organizing for rapid competition. However, even if one team member is a tinker toy expert, that expertise will be revealed by the pattern of tinker toy combination of the tower. Since follower groups can observe the tower, there are no first mover advantages in this exercise. The later groups almost always win. To have a first mover advantage, the early groups would have to work in a manner later groups could not observe them (e.g., in another room, or under a blanket), or be able to tie-up scarce resources (take a tinker toy part with them). It should also be discussed about how applicable the knowledge of a tinker toy expert might be in this sitting. For example, few students playing with tinker toys attempt to build a tall tower in a short amount of time. The tinker toy expert's knowledge may not be valuable in the current setting. If all groups have access to the expert or set of experts, then it may not even be rare. The insight from the knowledge is seldom difficult for later groups to imitate.

Since students cannot assemble the pieces during the planning period, they make assumptions about how the pieces will behave when "integrated." However, given the number of towers that fall and/or the bases that are wider than the height of the tower, many of the assumptions do not bear out. The successful team must cope with the unanticipated contingencies that emerge as the resources are assembled. So it is with firms that must develop strategic plans that involve acquiring resources that may or may not turn out to be complementary once assembled. The firm must retain flexibility to take advantage of idiosyncratic resources.

Rarity. Students should be questioned about how rare were the physical resources and the intangible resources required to build the tall tinker toy tower. The tinker toy pieces (unless you allow the earlier groups to hide one or two from the later groups) are certainly not rare - they are necessary for the tower, but not sufficient for success. Knowledge of tinker toys and organizational design are most likely heterogeneously distributed amongst the groups - and experts are most likely rare. Physical skills such as dexterity may also be important resources which are not common to all members of the class.

Imitability. Imitating earlier groups is key to success in this competition. Some minor modifications may be needed, but the time and the focus of the competition will force the groups to imitate successful actions. While the intangible resources (knowledge) may be unmeasureable, the actions or processes based upon the resources can be imitated. Later groups may have differing abilities to understand what were the keys to success for the earlier groups, and thus be more and less likely to be able to imitate the actions which lead to successful building. This issue can become a great discussion of benchmarking and competitor analysis.

Substitutability. In the basic design of this exercise, no tinker toy pieces may be removed; however, if "patents" or other preemptive actions allow for the removal of pieces, then later groups are forced to come up with substitutes for the removed pieces.

5.2. First Mover Advantages (and Disadvantages)

As the discussion on resources progress, it should begin to identify first-mover advantages and disadvantages. In the typical design, the experiment has first-mover disadvantages. However, as resources are made rare, inimitable, and difficult to substitute, then the experiment allows for more first-mover advantages.

Technological Leadership. The technology in this exercise is primarily the tower design. After a few groups, certain features of the tower become standard. It may be certain pieces are part of the base, it may be the base design has three or four corners, or it might even be the use of one path of toy pieces going skyward balanced only by the skill of the group. Similar to most technological competitions, the best design is not necessarily the one that becomes the dominant design. However, there are no gains to the group that develops the leadership in this technology in the Tinker Toy Exercise. The class may wish to discuss how such leadership may become part of the exercise.

Switching Costs and Buyer Uncertainty. Switching costs are more difficult to bring into the tinker toy discussion. It is possible to talk about how things might change if the class was split into two classifications of groups: 1) groups

which put together bases; and 2) groups which assembled towers on top of the bases. *Preemption.* The easiest way to allow for more first-mover advantages would be to allow the early groups to be able to pre-empt the later groups. This can be done through such things as removal of tinker toy pieces, or "patenting" tower design characters. If the groups are formed by the class, some groups may pre-empt others by gaining access to student members with rare skills.

Free-Rider Effects. Free rider effects are actions by some that benefit others. While learning occurs by the later groups, this learning is often based upon resolution of uncertainties.

Resolution of Technological or Market Uncertainty. The key to later groups doing better than earlier groups is the ability to imitate successful experimentations. Later groups occasionally misinterpret the experiment or take risks themselves. This risk taking can result in a new dominant design, or result in a tipped over tower (or smaller tower).

Shifts in Technological or Customer Needs. Usually with only a few groups and limited time, it is not advisable to switch the rules in the middle of the exercise. Still, the class can talk about what might happen if the later groups are told that the groups would get bonus "height" for including tinker toy pieces of a specific color, while earlier groups are only told that some colors might get this reward.

Incumbent Inertia. The design of the experiment creates incumbent inertia. Early groups are not allowed to rebuild their tower after their first attempt. When the experiment has been ran so that each group can go twice, many groups still build their tower in a similar manner to the earlier effort - regardless of the success of the earlier effort. The key to the discussion is to bring the issue of why incumbent inertia may occur in the market place.

5.3. Overall Keys to Learning

The process of the discussion should be made clear to the students. It should be noted that in this experiment there is one clear performance measure, and it is clear to all after the experiment which group performed the best. Thus, the first step of identifying the competitor to analyze is relatively easy. The next step of the analysis is to examine the why of success and the resources involved. Each possible resource advantage must holdup when being examined with the criteria of rarity, imitatability, and substitutability. The next step may be to discuss how your group could have created advantages over later groups, and overcome advantages of the earlier groups. These steps become important action steps for the students when they become managers.

6. Other Strategic Management/Business Policy Lessons Which Could Be Illustrated

While some of the lessons for a strategy course are similar to that of a general management course, the focus on organizational learning and imitation in a competitive environment exposes the class to content issues beyond the process issues. The interested reader should read McNeely's (1994) coverage of issues such as the mission statement, leadership, organizational form, controls, and regulations. However, the unique set-up of the sequential form of this exercise does allow for a more "strategic management" perspective.

6.1. Learning-by-Imitation versus Learning-by-Doing

Both the learning curve and imitation are key concepts in strategic management. Yet, students often confuse these two types of learning. The tinker toy exercise allows students to understand how they might improve their process by repeating the building of the tinker toy exercise. More importantly, the groups can visualize how later groups were able to learn by imitating the earlier groups. These concepts are difficult for students to visualize and often get confused within the lecture format. Few cases offer students enough practical experience to illustrate these different ideas.

6.2. Ethics

Too often students separate their ethics courses from their strategic management course. This exercise allows for a discussion of two important issues that transfer nicely between these two courses - 1) economic versus social motivation; and 2) pushing the rules. The students need to discuss how motivating the reward was as far as did they work harder knowing that there was a reward. Most groups take the exercise as a required part of the class - they are only following orders. Others find the challenge of "winning" to be the true reward.

Usually, there is at least one group that pushes the rules. That is, after time is called, they continue to modify their tinker toy tower. Ask them why they did this. If a later group also pushed the rules in a similar manner, this exercise can get the students to consider how the response of the professor might have signaled how such actions were going to be dealt with. The students should consider if such ethical behavior should depend upon how rules are enforced.

6.3. Diversification

Related diversification has long been an important strategic management concept. While physical relatedness is often understood, students often have more problems understanding relatedness based upon similar knowledge. The tinker toy exercise can be employed to express this idea by discussing with students if the winning groups would be as successful if the exercise is repeated with a different building material. The class can then repeat the exercise using other building toys (e.g., Legos, Builderifics, or square blocks).

6.4. Deliberate versus Emergent Strategy

One key issue in strategy is the importance of understanding the concepts of deliberate and emergent strategy. Historically, strategic planning has fallen from its once prominent position. Most groups find that their planning could not be precise, but had to be of general principles. They find that in the short amount of time, their emergent strategy (response to previously unforeseen factors) was more important than their deliberate strategy.

6.5. Core Rigidities

A key theme in strategy management is cognitive bias problems which limit the implementation of a strategic initiative. Core rigidities or organizational inertia present students with a difficult perceptual problem. Students often ignore the psychological and behavior barriers to change, and the uncertainties associated with modifications in strategies. After the taking part in the tinker toy exercise, students should be asked to contrast their planned strategy with their emergent strategy. If the exercise is played out over two or more trials then students will be able to watch as the other groups in their class continue to follow a given approach, even if the more successful groups are using another approach. That is, by using the tinker toy students can observe groups that do not adapt their approach from their original plans.

6.6. The Dominant Design

Often students have a difficult time understanding why a dominant design arises. Examples of the QWERTY keyboard or VHS (versus Betamax) allow the students to understand how markets might drive the industry towards a single design, but they do not allow the students to comprehend why firms might not attempt to experiment to break out of the dominant design. After the

exercise, have the students recall how the groups designed their various towers' base. Usually, the first two or three groups will attempt to use different bases (e.g., a square base, or a base with horizontal legs). Depending upon the success of the first few groups, later groups will only modify the successful early group's design. Hence, a dominant design will emerge.

6.7. Performance Measures

The exercise uses a single, relative measure of performance. Few organizations have such clearly defined objectives. The students should be asked to discuss how the measure of performance might affect their strategy. How might it matter if one set of stakeholders wish the organization to build the tallest structure while another might desire a structure that has at least a 12 inch perimeter at the base. The student should then be able to contrast the economist's call for managers to "maximize their returns" with the "beat your competition" approach.

For the groups that did not win, they need to consider whether their lack of success was due to bad strategy, poor implementation, or bad luck. More important, the groups need to consider how these different explanations might be used when examining strategic cases or when they are managers of actual organizations. If it was bad strategy, then most groups that used that strategy should have poor results. If it was bad luck, then the other groups using the strategy should have good results. Poor implementation is more difficult to isolate and may need to be discussed in more detail.

6.8. Modifications on the Theme

There are several modifications that could be employed to teach further strategic management concepts. 1) Multiple Periods: The exercise can be played out across multiple periods so that the class can better visualize how learning might occur over time. The members of the various groups could "buy" and "trade" members. The possible market for human resources allow the student to consider how the market for resources makes a resource advantage difficult to obtain (Barney, 1986). Usually, when the exercise is played out over multiple periods, the height of the winning tower always increases and usually most of the towers (that don't fall) grow as well. 2) Observers: When the exercise is employed in a large class format, observers are often useful. Observers offer less biased perspectives than class members caught up in a given team's approach.

7. Final Comments

This exercise is great for teaching various difficulties in comprehending concepts in strategic management, or could be used as an ice breaker for the opening day of a strategic management class. Not only do students get to know their classmates, there are enough issues in this exercise to expose students to the key issues in a strategic management course. As McNeely has suggested, it is also a great way to get students to be actively involved in the learning process. Finally, if the students are exposed to a version of this exercise in their organizational behavior class to understand teams, and another version in their principles of management course, and yet a third version in their strategic management course, then through this common exercise the students will be able to see that each course is not a separate experience but lessons from one course can be built upon in their later courses.

The key learning goal for this exercise is to help students better understand the FMA and RBV concepts. Playing with tinker toys in a class (especially by MBAs) is something that will be remembered. The exercise also illustrates concepts in a controlled experimental manner where the key variables are clearer to the students. The unusualness of this exercise will allow discussions throughout the semester (module, quarter) to go back to the exercise, and use it to frame other concepts. However, the key learning objective is to help students better understand the underpinnings of RBV and FMA.

References

Andrews, K.R.1971. *The Concept of Corporate Strategy*, Homewood, Ill: Dow-Jones Irwin.

Andrews, K.R., E.P. Learned, C.R. Christensen, and W. Guth 1965. *Business Policy: Text and Cases*, Homewood, Ill.: Dow-Jones Irwin.

Barney, J.B. October 1986. "Strategic factor markets: Expectations, luck, and business strategy", *Management Science* 42(10):1231-1241.

Barney, J.B. 1991. "Firm resources and sustained competitive advantage", *Journal of Management*, 17(1): 99-120.

Godfrey, P.C. and C.W. L. Hill. 1995. "The problem of unobservables in strategic management research", *Strategic Management Journal*, 16:519-533.

Lieberman, M.B. and D.B. Montgomery. 1988. "First-mover advantages", *Strategic Management Journal*, 9:41-58.

Lieberman, M.B. and D.B. Montgomery. 1998. "First-mover (dis)advantages: Retrospective and link with the resource-based view", *Strategic Management Journal*, 19:1111-1125.

Mahoney, J.T. and J.R. Pandian. 1992. "The resource-based view within the conversation of strategic management", *Strategic Management Journal*, 13:363-380.

McNeely, B.L. 1994. "Using the tinker toy exercise to teach the four functions of management" *Journal of Management Education* 18(4):468-472.

Miller, D. 1990. *The Icarus Paradox*, New York: Harper Business.

Penrose, E.T. 1959. *The Theory of Growth of the Firm*, New York: John Wiley.

Rumelt, R.P. 1984. "Towards a strategic theory of the firm", In R.B. Lamb (ed.) *Competitive Strategic Management*. Englewood Cliffs, N.J.: Prentice-Hall, pp. 556-570.

Teece, D.J. 1987. "Profiting from technological innovation: Implications for integration, collaboration, licensing, and public policy". In D.J. Teece (ed.), *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*. Cambridge, Mass.: Ballinger, pp. 185-221.

Wernerfelt, B. 1984. "A resource-based view of the firm", *Strategic Management Journal*, 5:171-180.