Understanding How Resources and Capabilities Impact Performance: Actively applying the resource-based view in the classroom

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Abstract

The resource-based view is a strategic framework for understanding why some firms outperform others. Its importance is reflected in its wide inclusion in strategy texts as a tool for assessing a firm's internal strengths and weaknesses. This paper outlines an experiential exercise which demonstrates how different bundles of resources and capabilities may explain differences in value created across firms. The primary benefit of this in-class exercise is that students actively apply Barney's (Barney, 1995; Barney & Hesterly, 2006) VRIO framework to understand why their team won or lost. The debrief can also focus on issues such as the impact of imitability on sustainability, why strategies emerge, and elements of a good strategy. Preliminary data from eighteen undergraduate and graduate sections indicates that learning objectives have been consistently met.

Keywords: strategic management education, experiential exercise, resource-based view, VRIO framework

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The resource-based view has become a standard tool for evaluating firm strengths and weaknesses as witnessed by its inclusion in many leading strategy texts (e.g., Afuah, 2004; Barney & Hesterly, 2006; Collis & Montgomery, 2004; Dess, Lumpkin & Taylor, 2005; Ghemawat, 2006; Harrison & St. John, 2004; Hill & Jones, 2004; Hitt, Ireland & Hoskisson, 2005; Pearce & Robinson, 2004; Thompson, Gamble & Strickland, 2004; Wheelen & Hunger, 2005). The main tenets of the resource-based view are that firms possess different resources, the differences are enduring, and these differences lead to variations in performance (Barney, 1991; Peteraf, 1993). The resource-based view has been operationalized by Barney's (Barney, 1995; Barney & Hesterly, 2006) VRIO framework, which hypothesizes that firms possessing Valuable, Rare, Inimitable, and Organized resources may be able to capture superior industry positions and thus enjoy superior performance.

Schneider and Lieb (2004) argue that despite its increasing relevance, the resource-based view is under-represented in the classroom due to the dominance of the industrial economics view, lack of simple models or heuristics, and application of a modernist perspective. This paper argues that one way to overcome some of these pedagogical barriers is to use experiential exercises that allow students to actively apply concepts. One experiential exercise that I have had great success with in teaching concepts from the resource-based view is PaperScape. Unable to find an exercise that met my learning objectives, I adapted PaperScape from one of Coff and Hatfield's (2000) *Experiential Exercises for Teaching Strategic Management*. While Coff and

Hatfield's (2000) Builderific exercise provides student groups with the same resources and asks them to build paper towers in order to generate a discussion on task planning, PaperScape provides student groups with different bundles of resources and asks them to build paper skyscrapers in order to generate a discussion on how differences in resources and capabilities impact performance.

PaperScape is a variation of the tinker toy exercise (e.g., Coff & Hatfield, 2003; McNeely, 1994). It differs significantly from McNeely's (1994) original exercise in that PaperScape focuses on teaching elements of competitive strategy. And while both PaperScape and Coff and Hatfield's (2003) tinker toy exercise illustrate concepts from the resource-based view, their expected learning outcomes differ substantially. In Coff and Hatfield's (2003) tinker toy exercise each group receives the same resources and groups build their structures sequentially in order to illustrate the interplay between first mover advantages and performance. The PaperScape exercise, on the other hand, demonstrates the role resources and capabilities play in generating superior performance and provides students a hands on opportunity to apply Barney's (Barney, 1995; Barney & Hesterly, 2006) VRIO framework.

When to Run PaperScape

The primary target audience includes students in undergraduate or masters' level Strategy or Business Policy courses, although I have had success using PaperScape with managers. PaperScape is run during the session where we discuss how the resource-based view, and in particular Barney's VRIO framework, can be used to evaluate a firm's internal strengths and weaknesses.

As a way of discussing the VRIO framework pick a successful firm and then have students suggest which resources and capabilities contributed to its superior performance (for example, Dell Inc. has resources such as scale, supplier relationships, brand name, custom manufacturing processes, etc.). Then have students evaluate if Dell's proposed resources and capabilities meet the VRIO criteria. One key point you can raise is that if a firm does not possess any resources or capabilities that pass Barney's VRIO criteria, it lacks potential to earn long term economic rents. If a firm without VRIO resources manages to earn economic rents, current rivals or new entrants can easily copy this winning strategy by accessing the same resources, thus driving the economic rent to zero (Barney & Hesterly, 2006). It is only by implementing strategies based on leveraging VRIO resources that managers can hope to protect profitable positions from imitation.

The last step is to go over the competitive impact and performance implications of each of Barney's (Barney, 1995; Barney & Hesterly, 2006) VRIO criteria (see Table 1 in appendix). When reviewing this table, I recommend leaving the last two columns blank and have the students suggest what the competitive impact and performance implications are if a firm has a resource which is 1) not valuable, 2) not rare, 3) not inimitable, or 4) not organized.

Insert Table 1 here

How to Run PaperScape

After you are satisfied that students understand the basics of the resource-based view, run the PaperScape exercise. It is possible to run PaperScape in as little as 45 minutes, but I recommend using 60 minutes to allow for an in-depth discussion. Assuming you have eight or more groups, two student groups get two rolls of tape and 40-50 sheets of paper (preferably recycled) each. All remaining groups should be given 40-50 sheets of paper, 10-15 paper clips, and 5-8 rubber bands each. Thus the only difference between each group's resource endowments is the elements with which they have to bind paper together; one or two groups will have tape, while the remaining groups will have paper clips and rubber bands. Although you may use any 'resources' such as twigs, cardboard, or string to build skyscrapers, using just two sets of resources keeps it simple and drives home the point regarding the differential impact of resources on performance.

Review learning objectives and instructions for PaperScape (2 minutes)

The goals of the exercise and instructions are placed on two separate slides. The learning objectives of PaperScape are for students to:

- Understand the role resources and capabilities play in achieving competitive advantage using Barney's VRIO Framework,
- Discuss elements of a good strategy,
- Start teambuilding in their groups, and
- Build the highest paper skyscraper with the resources and capabilities their firm has.

Students may be disappointed with the resources they are allocated so you may remind them that as with real world firms they may not always have the resources they desire.

The instructions for the exercise are:

- You have 10 minutes to plan the way your group will build the tallest paper skyscraper with the resources and capabilities you have. The skyscraper cannot lean on anything, nor are you allowed to hold it up. It is possible to trade resources with other groups during the planning period, however, you are not allowed to trade strips of tape, you must trade the entire roll. You can touch the materials, but please do not start building until the instructor announces that the building period has started.
- Your group will have 5 minutes to build your skyscraper.
- After 5 minutes, the instructor will call time, measure each skyscraper, and announce the winning group.
- You will be provided time to discuss and answer the questions regarding to the exercise in your group – please see the hand-out questions. The exercise will conclude with a class discussion of the hand-out questions.

Assign Students to Groups and Allocate Resources to Groups (3 minutes)

Place the students in groups of 3-6 (in a class of 50 you would have 10 groups of five students and would require 10 sets of resources)[1]. If you have already selected case groups you may use these, otherwise you can assign students to groups randomly. After explaining the

[1] The exercise can be run with as few as two groups. However, with fewer than 6 groups give only one group tape and give the remaining groups paper clips and rubber bands.

exercise and showing students the sets of resources (which I place in piles at the front of the classroom prior to class), ask them which set of resources they would prefer. Students typically indicate that tape is superior to rubber bands and paper clips for the task of building paper skyscrapers (i.e. a priori students should agree tape is valuable, rare, and inimitable). At this point randomly allocate the resource sets to the groups. Usually I pick a number between 1 and 100 and have students guess. The group with the closest guess gets to pick first, which allows a discussion regarding the role of luck in explaining why some firms outperform others (e.g., Barney, 1986).

Plan and Build Skyscrapers, Then Declare a Winner (15 minutes)

Allow the groups 10 minutes to plan their skyscraper and tell them they are allowed to trade resources. As an option you can warn them that their paper skyscrapers should be able to withstand a mild 'wind' (I typically blow on them). At the end of the 10 minute planning session announce the building period has started. After watching a flurry of student building activity, call time after five minutes has expired. At this point, I typically have fun blowing on and then measuring each group's skyscraper (you can use a measuring tape, but I usually use myself as the yardstick). Finally, declare a winner making sure everyone sees the winning skyscraper and understands which physical resources the group possessed.

Small Group and Class Discussion (20+ minutes)

Hand out the following questions as a basis for small group and class discussion. If you are running short of time, you can start the class discussion immediately, although I have found there is merit in letting students have 10 minutes to attempt to answer the questions in their

groups. If students have not had time to discuss the questions amongst themselves, I recommend starting the discussion with question 3.

1) Which resources/capabilities contributed to the success of the winning group (evaluate which were **V**aluable, **R**are, **I**nimitable and **O**rganized)? Were any of the resources or capabilities not **V**aluable?

   The purpose of this question is to give students practice in using the VRIO framework. You may start the discussion by picking a resource, say paper, and then asking what are the competitive and performance implications of a resource that is valuable, but not rare? You then can review paper clips and rubber bands, and finally tape.

   Part two of the question leads students to see the implications of a resource or capability that is not valuable. If a resource or capability is not valuable, it is a weakness, as it causes the firm to have lower performance than otherwise. You then can ask if any groups had resources or capabilities which were not valuable. Perhaps the inability to work as a team? To drive the point home, you can ask for examples from existing companies which exhibit lower than industry average performance due to possessing resources or capabilities which are not valuable.

2) Did it help to trade resources? Can you trade capabilities?

   Groups are allowed to trade resources during the planning period. Typically, no one trades and you can probe this by asking why. The students usually understand that the reason for this is that you can only trade tape for tape. This is the case in the real world as well. If a firm wants to buy a valuable resource it must pay an amount equal to the

expected future cash flows; there are no 'bargains' or short cuts to success (Barney, 1986).

When you ask if they can trade capabilities, students begin to understand that they are usually tied to an individual (i.e. knowledge or relationships) or groups of individuals (collective learning or reputation) and thus capabilities are difficult, if not impossible, to acquire.

3) Why did the winning group win? Better resources/capabilities? Better strategy?

In my experience, groups with tape win only one-third of the time. This is much lower than one would anticipate given that tape is a superior resource and thus should provide a competitive advantage[2]. There are three reasons why groups with tape may not win: capabilities of other groups, group organization (or lack thereof), and differences in strategy.

There are other 'assets' that students generally do not think of a priori such as the ability to work together, creativity in planning, ability to work quickly as students only have five minutes to complete their skyscraper, previous construction experience, or an engineering background. The discussion leads one to examine the role of capabilities as it is generally capabilities that decide which team wins PaperScape.

[2] A winning strategy for groups with tape is to build a structure which resembles a radio tower. Winners roll up the paper into tubes, connect and reinforce the tubes with tape, and then use long strips of tape as guide wires which stabilize the long tube of paper (typically several guide wires are needed).

You can point out this result is mirrored in the real world; capabilities typically lead to superior performance since they are hard to observe and thus imitate. Capabilities are also protected from imitation as they require time to develop due to what Dierickx & Cool (1989) label time compression diseconomies. You can note the reason some groups function better as a team may be that they have previously worked together. To follow up, you can ask how difficult is it to imitate a team with high cohesiveness? It is challenging as to get to this point typically teams have to go through the stages of forming, storming, and norming before they reach the stage of performing. You can use this to make the point that capabilities are path dependent – in a sense 'where you end up, depends on where you start'.

Another reason for groups losing with tape is that they were not well organized. This provides an opportunity to further discuss the "O" in Barney's VRIO framework. You can emphasize that if a firm is to succeed it is not enough to own strategic resources, firm managers must be organized to take full advantage of these resources. The second issue is recognizing resources, but more particularly, the capabilities groups may possess. Did the firm take into account all factors prior to formulating its strategy? This leads us to a discussion of what is a good strategy.

Groups will exhibit different strategies. You can ask students what was their strategy. After eliciting several responses you can move on to ask what is a good strategy? Groups only have five minutes to construct their skyscraper so they need a strategy that fits the

resources and time they have. This is a point that can be emphasized in the discussion; good strategies take advantage of firm strengths while avoiding any weaknesses, plus they exhibit a strong fit between what managers would like to do and what managers have the ability to do. Pause here to reflect on the role of time. Time is often neglected since all groups are given the same amount. However, its impact is significant as many groups underestimate how long their strategy will take to implement (or stated another way they over-design their paper skyscraper). Ask if time is a constraint or a strategic resource that needs to be organized? This discussion provides an opportunity to discuss how firms can use time to their advantage. There are firms that are continually pressing their industry forward by introducing new products. They do not wait until they have perfect product to bring to market, just a better product in the eyes of the customer. This competitive tactic challenges firms that are not capable of moving as fast.

4) Would the result have been different if all groups were given the same resources? Which group would have won then?

This question allows you to return to the role intangible resources and capabilities play in achieving competitive advantage. Typically, when I ask this question the more boisterous groups will argue that they would win if each group had the same resources. You can challenge them or others in the classroom by asking why they would win. What resources or capabilities do they have that other groups do not? Push them further, do these resources or capabilities meet the VRIO test?

After completing this discussion the instructor can alter the scenario to one where all groups have similar capabilities as well as similar resources. Now ask if it is possible to

sustain a competitive advantage. Under this scenario any advantage is temporary since each position is easily imitable. If you like you can bring in D'Aveni's (1994) concept of hypercompetition; all firms have similar resources and capabilities (or possess resources and capabilities which are easily imitated or substituted). Under hypercompetition the only advantage is the ability to quickly spot profitable market niches, seize them, and then move on before competitors enter the niche and drive economic rent to zero.

5) Did you change your strategy after the construction period had started? Why?

In almost all classes, at least one group attempts to change its strategy midway through the construction period. Students are not allowed to 'test' their strategy prior to actually building their paper skyscraper so they may be forced to alter it underway. This question allows the instructor to cover Mintzberg's (1987) concept of deliberate versus emergent strategies. Ask the students why they changed their strategy? You can reinforce this by noting that companies also have difficulty forecasting all strategic contingencies and are often forced to change their strategy due to changing circumstances.

Other Potential Areas for Class Discussion

The role that intangible resources and capabilities play in what some have referred to as the 'newer' economy (e.g., Drucker, 1999; Kaplan & Norton, 2001) can be probed in a number of ways:

- One can point to the fact that the relative value of tangible resources vis a vis intangible resources and capabilities has changed significantly over the past century. In Henry Ford's age it was the firm with the best tangible resources (i.e. its factory) that typically

enjoyed the best performance. In the 'newer' economy, where there is easier access to tangible resources, it is the intangible resources and capabilities that are critical to achieving competitive advantage.

- You can note that in the 'newer' economy one cannot generally identify which firms will enjoy a competitive advantage just from looking at a firm's balance sheet since the key intangible resources and capabilities are either undervalued (i.e. patents) or not included (i.e. value of reputation, relationships with stakeholders, corporate culture, or knowledge-base). To make the point clearer you can mention that in 1978 there was almost a perfect correlation between firm's stock market value and its book value, while in 1998 book value had dropped to 28% of a firm's stock market value (Dess, Lumpkin & Taylor, 2005). As Dess, Lumpkin and Taylor (2005) note current financial reporting standards were developed 50+ years ago and provide little guidance regarding firms' financial or strategic potential today.

- PaperScape can also be used to discuss first-mover advantages and disadvantages (e.g., Coff & Hatfield, 2003). For example, you can ask who would win if the groups built their skyscrapers sequentially, instead of simultaneously. What are the benefits of going first? What are the benefits of going last? How can firms sustain a first-mover advantage? How can later entrants overcome these advantages?

- A final way to extend PaperScape is to discuss team-building issues. This is especially salient if you use the same teams as their case groups. One issue that pops up is that

groups with one or two dominant individuals may rush the decision with respect to choosing a strategy for building their paper tower. These groups are easily recognizable as they finish planning in a couple minutes and then sit talking for the remainder of the planning session. Unfortunately, these groups inevitably fare poorly when it comes to building their paper tower. If this occurs you can discuss whether making a quick decision is a blessing or a burden. Does everyone get a chance to be heard? If no, how can you improve brainstorming in your group? If the instructor did not observe this phenomenon, the instructor can still ask questions regarding the group process. For example, the instructor can start off by asking what process the teams used to come up with their strategy. Questions such as what behaviours helped your team accomplish the task and what behaviours hindered your team also provide a starting point for this discussion.

Results

Informal student feedback indicates they enjoyed participating in the exercise. However, a more important question from a pedagogical view is whether the exercise has met my learning objective of introducing students to the role resource and capabilities play in achieving competitive advantage? Since Fall 2001, 472 students have rated this exercise using a mid-term survey. The survey question reads: "*PaperScape (Building Paper Towers to understand how resources help achieve competitive advantage)",* and asks students, *"To please rate each of the following in-class exercises. Circling a 1 indicates you learned nothing from the exercise. Circling a 10 indicates that you feel you have an excellent understanding of the concepts employed in the exercise."* The overall average rating for PaperScape from eighteen (18)

masters' and undergraduate sections is 7.91 (n= 472). The average rating for eleven undergraduate sections was 7.89 (n = 308) and the average for seven masters' sections was 7.95 (n = 164). PaperScape has also been run with three groups of managers in different settings with success. Although I did not collect data regarding their experiences, anecdotal feedback from participants was very positive.

Conclusion

PaperScape is an easy exercise to run and the resources needed (tape, paper clips, rubber bands, and paper) are readily accessible to most instructors. The benefits are that it is well-suited for demonstrating the concepts from the resource-based view, but it also provides an opportunity to probe issues such as the importance of capabilities for sustaining competitive advantage and the impact of learning on emergent strategy. Other intangible benefits of PaperScape are that it creates energy in the classroom, it caters to students who favour learning by doing, and last but not least, it is fun for the instructor to run and students to participate in.

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Appendix

Table 1 – Performance Implications of Barney's (1995) VRIO Criteria

Performance Implications of Barney's (1995) VRIO Criteria

VALUABLE?	RARE?	INIMITABLE?	ORGANIZED?	**Competitive Impact**	Performance Implications
NO	**-**	**-**	**-**	Competitive Disadvantage	Under Industry Average
YES	**NO**	**-**	**-**	Competitive Parity	Industry Average
YES	**YES**	**NO**	**-**	ST Competitive Advantage	Over Industry Average
YES	**YES**	**YES**	**YES**	LT Competitive Advantage	Over Industry Average