
Beyond Textbook Cases- Exploring the Pedagogical Utility of Medical Analogy and Metaphor in Learning and Teaching Strategic Management

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Abstract

Students of strategic management are often inundated with a plethora of analytical tools from which they must choose a select few to help them to effectively analyse the forces impacting the sustainable competitiveness of an organisation. Choosing the right tool(s) can be daunting, yet crucial for understanding organizational challenges and crafting relevant and effective strategic solutions. This desk research study explores the utility of analogies and metaphors as pedagogical tools to prepare students to become adept in strategic analysis. Aristotle likened metaphors to puzzles, suggesting that, like puzzles, metaphors engage us in figuring out how one thing resembles another. It is during this active participation and interpreting that makes analogies and metaphors effective in making complex strategy concepts more relatable to students. Through the process of analogical encoding, this conceptual study argues that the medical analogy holds promise for effective scaffolding of students' learning, demystifying abstracts and making them more relatable in addition to structuring thinking across domains as well as promoting critical thinking, decision-making, creativity, problem-solving, collaboration and communication skills - key 21st century skills sought by industry. By leveraging familiar medical analogies, teachers or educators can promote learner-centred authentic learning, simultaneously enhancing the students' learning experience.

Keywords: Pedagogy, Medical Analogy and Metaphor, Learner-Centred Authentic Learning, Student Engagement, Strategic Management

1. Introduction and Study Background

As the twenty-first century workforce evolves, demand grows for employees equipped with strong problem solving, teamwork, communication, leadership, managerial, and systems thinking abilities (World Economic Forum, 2016; World Bank, 2019). The shifting skills/competencies sought by modern employers have led to a corresponding need to transform education and teaching practices to adequately prepare the emerging workforce for twenty-first century job requirements (Binkley et al., 2012; Holtzman & Kraft, 2011; Mulryan-Kyne, 2021). However, it has been observed that university teaching not only promotes solitary learning experiences that impede the attainment of profound understanding (Lea et al., 2003; Baeten et al., 2010), but they are also often dominated by abstract concepts, and content that lack meaningful connections to students' everyday experiences (Lombardi & Oblinger, 2007; Willison, 2018) ultimately failing to help students to either develop deep conceptual understanding (Mulryan-Kyne, 2010; Schank, 2019; Schroeder et al., 2007; Eldeen et al., 2018) or evolve into critical thinkers capable of profound reflection for personal growth and societal change (Espinoza & Vossoughi, 2014; Schank, 2019).

The problem of linking theory to practice is evident in the learning and teaching of strategic management, especially because the field of strategic management is remarkably broad, encompassing a diverse array of theoretical perspectives, empirical phenomena, and methodological approaches, which can pose significant challenges for instruction (Napshin, & Marchisio, 2017). The complex and abstract nature of strategic management concepts, coupled with the challenge of bridging theory and practice, creates significant obstacles in the learning and teaching of this critical discipline, necessitating innovative pedagogical approaches and a stronger emphasis on practical applications. In a study conducted to assess the acquired knowledge of university management students on strategy and strategic management concepts, it was found that students encountered challenges when attempting to articulate theoretical definitions of strategic management in the context of real-world applications (Wagner et al., 2014). As succinctly captured by Greiner et al., (2003), "Strategy students today tend to experience a rather abstract approach to learning about strategy presented through the limited prism of a theoretical discipline" with very small doses of "learning by doing" (Greiner et al., (2003,p.402).

Required therefore are learning facilitation interventions that put the student at the centre of an authentic learning practice that targets the development of 21st century skills/competences such as communication, collaboration, critical thinking, and problem-solving (Allen et al., 2012; Cairns, et al., 2017), literacy, numeracy, information, and communication technology capability, personal and social capability, ethical understanding, and intercultural understanding (Australian Government Department of Education, n.d. para.1).

In considering the most effective learning facilitation methodologies, it's important to acknowledge that in today's world, where vast information is readily available through ubiquitous computing and search engines, cognitive abilities such as categorization, generalization, inference-making, and knowledge transformation may form the foundation for academic success (Richland & Simms, 2015). In this respect, there is hope for resolution of this problem as research suggests that tropes in the form of analogy and metaphor possess potential for student-centred learning, enabling them to improve comprehension of abstract topics (Jee et al., 2014; Gentner & Hoyos, 2017; Lombardi et al., 2021). Indeed, if real learning is a complex mental process that takes place when students actively construct knowledge by working with information, and not just passively receiving it (Lombardi et al., 2021 Hoidn & Reusser, 2020), then the analogy and metaphor tropes are excellent avenues for authentic student-centred learning. This is because their application involves students in, not merely receiving teacher transmitted information and reproducing it, but engaging in working on, processing, interpreting, and negotiating the meaning of the information encountered (Hoyos et al.,2020).

In response to the increasing focus on enhancing the quality of learning and development of 21st century skills/competences, this study examines the pedagogical potential of two intertwined tropes- analogy and metaphor in effectively engaging strategic management learners in participatory, student-centred authentic learning activities. It is noted in this study that despite the prevalent use of analogies and metaphors in our language, their potential as impactful teaching methods in strategic management remains unexplored, especially in relation to their ability to explain complex or abstract strategy concepts.

This study therefore explores the use of medical analogies and metaphors as a student-driven learning and teaching approach in strategic management. Specifically, the study investigates how medical analogies and metaphors can facilitate students' understanding and active engagement with complex strategic management concepts, helping them build mental models that facilitate their understanding and application of strategic management concepts to real-life management contexts. In their research on transfer of learning, several scholars have demonstrated that drawing analogies to prior knowledge can facilitate insight and understanding of new material and also found that when learners connect new concepts or ideas to their existing knowledge through analogical and metaphorical reasoning, they gain richer insights into the new information or concepts (Bassok, 1990; Bassok & Holyoak, 1989; Catrambone & Holyoak, 1989). Ultimately, the study assesses the utility of leveraging medical metaphors and analogies to enhance both the student learning process and instructors' teaching process within the strategic management domain, guided by the following three research objectives:

1. To examine the potential benefits of analogy and metaphor based, student-driven learning approaches in strategic management education.
2. To analyse how analogies and metaphors can aid students in constructing mental models and engaging actively with strategic management concepts.
3. To assess the utility of medical analogy and metaphor in facilitating the learning and teaching processes of Strategic Management

2. Methodology

This conceptual paper employs a qualitative literature review methodology to build an argument for using medical analogies in strategic management education. A systematic search is conducted to identify relevant studies in the areas of cognitive science, education theory, analogical reasoning, metaphor theory, in relation to enhanced student learning experience and development of key 21st century skills are reviewed (Jensen, 1996; Holyoak & Thagard, 1989; 1997). Several sources are analysed and synthesized about the cognitive mechanisms behind analogical encoding that facilitate student learning of abstract concepts. The study is situated within the constructivist research paradigm, which holds that reality is multiple and shaped by context and individuals' experiences (Guba & Lincoln, 1994). From an ontological perspective, the constructivist paradigm views reality as subjective and socially constructed, while epistemologically, it posits that knowledge is co-created through the interactions between the researcher and the researched (Creswell & Poth, 2016). The use of analogy and metaphor aligns well with the constructivist view, as these cognitive tools allow learners to construct new knowledge by drawing connections between abstract concepts and their existing experiences and understanding of the world (Aubusson et al., 2006). By providing familiar reference points, analogies and metaphors facilitate the co-creation of meaning and enhance the learning process within a constructivist framework (Duit, 1991).

3. Negotiating the Strategic Management Process and the Maze of Strategic Analytical Tools

The teaching and learning of strategic management with the aim of developing, in students, a deep understanding of the forces that shape an organization's operations and generate effective solutions can be a very challenging task. This is primarily because strategic management encompasses a vast range of interconnected concepts, theories, and frameworks whose interplay requires significant cognitive effort and critical thinking (Grant, 2023). For strategic management students to become more adept and confident in strategic analysis requires teachers to apply appropriate student-centred instructional methodologies. To this end, strategic management students are exposed to the strategic management process (Wheelen & Hunger, 2011) and strategic analysis (Grant, 2021).

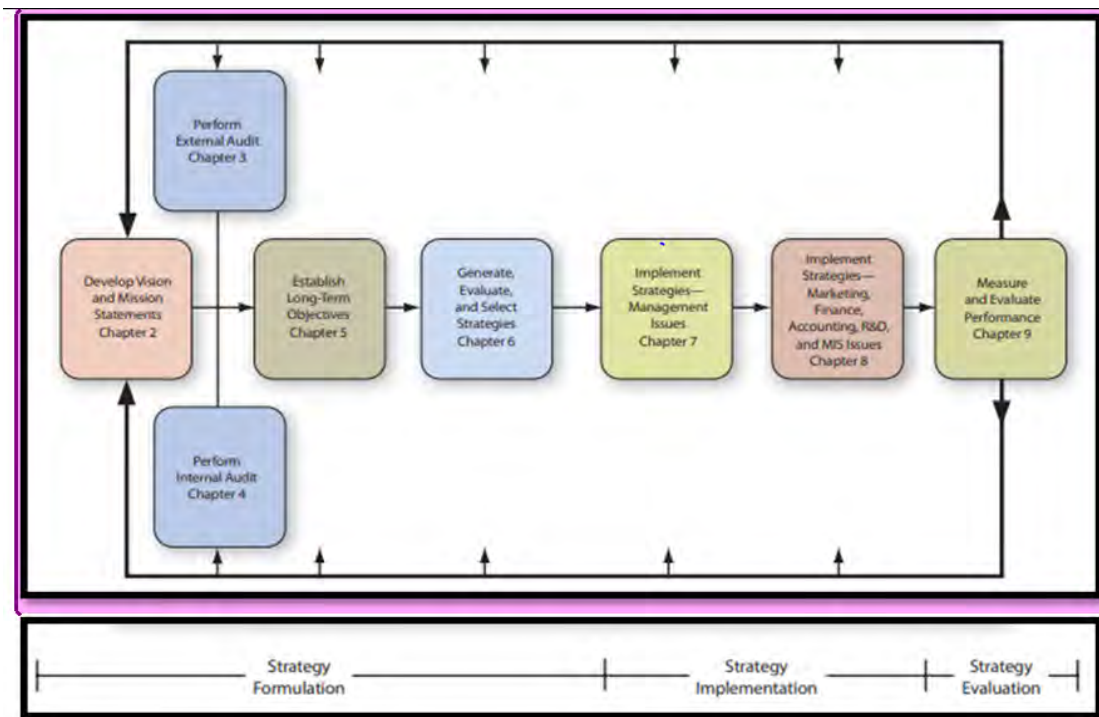


Figure 1: Comprehensive Strategic-Management Model
 Source: Adapted from David, 2007, P.16

Figure 1 illustrates the strategic management process which involves several key logical and sequential steps. Although the strategic management process has been characterised as ineffective, in its defence, Stacey argues that the procedures and analytical techniques of modern strategic management “create a framework for strategic thinking and, it is assumed, managers who think strategically are bound to act more effectively in dealing with the future” (1993, p.18).

As the students learn about the strategic management process, they are also introduced to the concept of strategic analysis, defined by Worrall as the development of,

a theoretically informed understanding of the environment in which an organisation is operating, together with an understanding of the organisation’s interaction with its environment in order to improve organisational efficiency and effectiveness by increasing the organisation’s capacity to deploy and redeploy its resources intelligently (1998, p.1).

The strategic analysis tools that students learn include among others, SWOT Analysis, Value Chain Analysis (Porter, 1989), Resource-Based View and VRIO Framework (Barney, 1991; 1995), Core Competencies (Hitt et al., 2016), Balanced Scorecard (Perramon et al.,2016; Kaplan & Norton, 1992; 7S Model (Waterman, 1982), Scenario Planning (Schoemaker, 1995), PESTEL Analysis (Henry, 2021), Porter’s Five Forces (Porter, 1989; 2004; 2008), Hotel Competitor Analysis Tool (Enz & Thompson, 2011), Destination Competitiveness Model (Ritchie & Crouch, 2003), Butterfly Competitiveness Model (Altinay & Kozak, 2021), Critical Success Factors Model (Rockart, 1979), Gap Analysis (Parasuraman et al., 1985; 1988), Customer Journey Mapping (Rosenbaum et al., 2017), Market Segmentation (Johnson, 1995), Perceptual Mapping (Rothschild, 1987), BCG Matrix, GE/McKinsey Matrix (Rudnicki & Vagner, 2014), Product Life Cycle (Levitt, 1965), and Triple Bottom Line (Elkington,1994). These strategic analytical tools in the preceding paragraph, while far from being exhaustive, demonstrate the complexity and eclectic nature of the landscape of strategic analyses tools that students must sift through to locate the right one for the right challenge. In this respect, the sometimes adaptive (Hofer, 1973), structured, linear/processual, purposeful, and logical (Chandler, 1962), and interpretive (Pettigrew, 1977) nature of both strategy and the strategic management process, coupled with the maze of available strategic analytical tools, often leave students feeling confused about how to effectively match the right tool with the right strategic management challenge. This challenge is further compounded by the fact that in analysing the environment, the tools used must achieve ‘strategic fit and alignment’ (Evans, 2019; Tribe, 2016) and avoid ‘strategic drift’ (Ansoff, 1965; Johnson et al., 2008).

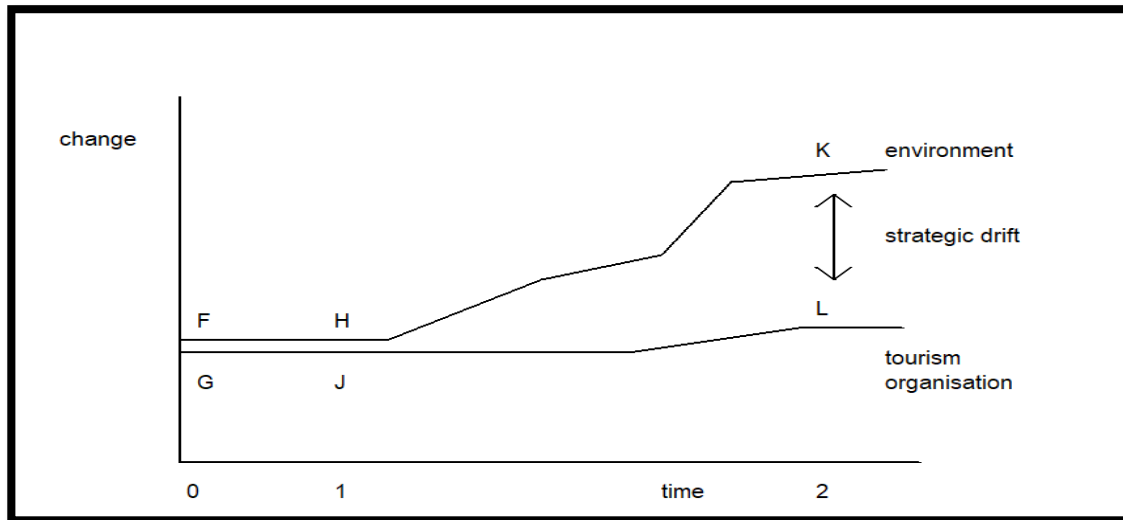


Figure 2 Avoiding Strategic Drift
Source: Tribe, 2016, p.14

Figure 2 illustrates the concept of strategic drift which occurs when an organization’s plans become mismatched to changing conditions, leading to declining competitiveness and performance (Johnson et al., 2008).

Additionally, strategy formulation and implementation incur significant financial costs for example, market research, human resources, and technology, as well as indirect costs associated with opportunity costs, implementation inefficiencies, and change management (Walker, 2021). Organisations incur these expenses with the anticipation of a positive return on their investment (ROI) ultimately reinforcing the importance of teaching students in such a way that they become competent in matching the strategic challenge with the right analytical tools and to avoid wasting organisational resources.

4. The Promise of Analogy and Metaphors in Teaching Complex Strategic Management Concepts

How then can students learn to cultivate the confidence and skills necessary to navigate this eclectic labyrinth of strategic analytical techniques effectively as well as understand the abstract strategy concepts and simultaneously develop 21st century skills/competences? As aptly observed, the debate on the discourse on teaching twenty-first century skills has evolved from questioning its importance to examining the methodologies for effective delivery (Binkley et al., 2012).

Pedagogical tools that can make the learning of complex abstract concepts more relatable and accessible require more examination. In this respect, insights to address this problem can be drawn from studies that frame ‘tropes’ in the form of analogies, metaphors, metonyms, binary oppositions, and paradoxes as useful cognitive tools, aiding individuals in understanding and interpreting, communicating and making sense of the world (de Man, 1979; Nerlich, 2010; Nerlich & Jaspal,

2012). As figures of speech, tropes use words “in a sense other than the conventional or literal one for which they are intended” (Oswick et al., 2002, p. 295).

However, this study focuses on only two intertwined tropes - analogy and metaphor - as powerful pedagogical tools in studying strategic management. The study explores the potential embedded in these figurative devices for dynamic teaching and learning, especially in strategic management where abstract concepts and intricate frameworks are common.

5. Analogies and Metaphors Defined

Since the mid-twentieth century, philosophers have acknowledged the pervasive nature of metaphor and analogy in human thought and their foundational role in discourse, enabling mental leaps (Black, 1962; Lakoff, 2014). As noted by Dickmeyer,

We must admire the complexity of our social world and strive to grasp increasing numbers of dimensions and interactions. To do this we must use multiple lenses to help examine the world with models ... to make us ever more sophisticated observers”. (1989, p. 159).

But what are analogies and metaphors or what is analogical and metaphorical learning? According to Hofstadter (2001), analogy is the ‘core of cognition’ as well as the core of ‘higher order thinking (Richland & Simms, 2015). Analogy compares two similar things, highlighting shared features to explain an unfamiliar concept acting like a bridge, drawing upon the familiar to illuminate the unknown (Gentner & Maravilla, 2018). Additionally, Gentner and Maravilla (2018) define analogy as referring to a similarity between two things where the same pattern of relationships is present even though the elements themselves differ. They also state that analogies identify comparable connections across different contexts or scenarios and that the individual components of the two analogues do not need to be the same, but the relational structures linking those components must share commonalities. In essence, analogies detect parallels between systems by focusing on aligned relational architectures rather than surface attribute matches (Gentner et al., 2022). Analogy therefore serves as a means of expressing that two situations or domains possess a shared relational structure, even in the presence of arbitrary differences in the objects constituting these domains (Gentner & Markman, 1997). For example, the common analogy between a planet orbiting the sun and a boat floating on a river captures the common relational structure of an object being pulled by a force, despite the objects themselves being very different. Therefore, analogy allows us to see how two different situations or domains share a similar underlying pattern or structure, even though the specific objects involved in those situations may be completely different

Similarly, metaphors, as described by Lakoff and Johnson (1980a), involve the symbolic representation of one concept in terms of another, allowing learners to grasp abstract or complex ideas through more concrete and familiar associations. However, besides taking the comparison a step further, directly stating that one thing is another, metaphor also goes beyond surface similarities, suggesting a deeper and often emotional connection (Chowdhury, 2021). Metaphors therefore provide a mental framework to organize and understand complex ideas (Kolodner, 2002a, 2002b, 2002c). They act as ‘conceptual bridges’ (Gentner & Clement, 1988), linking unfamiliar concepts to familiar experiences. By bridging the known and the unknown, metaphors and analogies enable us to make sense of the world around us and effectively exchange ideas with others (Fogelin, 2011; Kanthan & Mills, 2006; Rix, 2021). In their seminal work ‘*Metaphors We Live By*’, cognitive linguists Lakoff and Johnson (1980a) argue that metaphorical thinking pervades everyday language and thought. In another of their studies, they argue that metaphor is not just a rhetorical embellishment but a fundamental mechanism by which people conceptualize abstract concepts and perform abstract reasoning (Lakoff & Johnson (1980b). As Aristotle proclaimed, “To have great ideas, start with a great metaphor” (cited in Richards, 2003). Several studies have established that metaphors play a central role in human sense-making and understanding (Nardon & Hari, 2021). The “essence of metaphors is understanding and experiencing one kind of thing or experience in terms of another” (Lakoff & Johnson, 1980a, p. 455). Whilst analogies are used to draw similarities between two different things or concepts, aiming to explain a complex idea by comparing it to something more familiar, metaphors are a form of analogy that directly states that one thing is another, suggesting a likeness or resemblance between the two (Henry, 2021). Metaphor examples include talking about life in terms of journeys, theories in terms of buildings, arguments in terms of war, social organisations in terms of plants and ideas in terms of food (Kovecses, 2010). Therefore, the distinction between analogy and metaphor therefore is generally characterized by a matter of degree rather than a categorical difference (Krennmayr, 2021), with metaphors typically encompassing a broader scope concerning domains of knowledge and language use implicated or invoked in the comparison.

The two tropes - analogy and metaphor- therefore essentially work hand in glove and their fundamental role in human understanding and the pervasive nature of analogical and metaphorical reasoning in human cognition, is powerfully expressed by Aristotle, who asserts, “The greatest thing is to be a master of metaphor,” and by the transcendentalist Henry David Thoreau, who articulates, “All perception of truth is the detection of an analogy, we reason from our hands to our head” (Bartlet, 1997,p.1).Bartlet suggest that our understanding of abstract complex concepts ultimately stems from drawing analogies to concrete experiences and things we can directly perceive through our senses. From a learning perspective, this highlights the critical role that concrete, embodied experiences play in learning abstract, theoretical concepts. Analogies therefore act as bridges linking familiar knowledge to new, unfamiliar concepts.

6. The Pedagogical Utility of Analogies and Metaphors in Teaching Strategic Management

To better appreciate the learning value of analogies and metaphors starts, it is important to start by contextualising them within experiential learning especially because of the latter's emphasis on learner agency and experiential student-centred learning (Dewey, 1938; Kolb, 1984; Kolb, & Kolb, 2009; Otte 2016). As Maries and Singh (2023) explain, analogies prompt learners to actively relate new concepts to familiar knowledge, consistent with Dewey's emphasis on learning from experience. Analogies prompt learners to relate new concepts to familiar knowledge, consistent with Dewey's emphasis on experiential learning (Miettinen, 2000). Situating metaphorical and analogical reasoning (Forbus, 1997; Mars et al., 2021) within experiential learning frameworks highlights the student-centred, active learning processes they can promote. This emphasises a perspective of learners as knowledge transformers and not knowledge consumers.

Additionally, understanding the learning value of analogies and metaphors requires recognition of their centrality to human conceptual systems and their intimate connection to common cognitive activities like reasoning, problem solving, knowledge transfer, and negotiating (Gentner et al., 2001; Holyoak, 2005a; 2005b; 2012). The role of analogies and metaphors in enhancing learning is therefore apparent when considered from the perspective that modern life and jobs require advanced skills and abilities such as inter alia, problem solving skills, and critical thinking (Muzam, 2023). Analogy serves as a cognitively grounded and generalizable definition of higher order thinking and a fundamentally different way of envisioning learning (Holyoak, 2005a, 2005b; Richland & Simms, 2015). To be successful in school and life students must tap higher order thinking skills and research shows that these higher order skills can easily be developed using metaphors and analogies (Richland & Simms, 2015). In this respect, Gentner and Toupin (1986) claim that analogy is a fundamental cognitive process underlying most other cognitive processes (Hofstadter, 2001; for example, problem solving and learning (Brown & Clement, 1989; Gick & Holyoak, 1980, 1983; Thibodeau & Boroditsky, 2011), scientific discovery (Dunbar & Blanchette, 2001), and creativity (Johnson-Laird, 1989; Ward, 1998).

Similarly, with reference to metaphors, Shuell argued that,

If a picture is worth 1,000 words, a metaphor is worth 1,000 pictures! For a picture provides only a static image while a metaphor provides a conceptual framework for thinking about something (1990, p.102).

Therefore, metaphors are “not just some nice add-ons in language but are instead basic cognitive mechanisms that enable humans to make sense of their surrounding world” (Wegner et al., 2020, p.1). Metaphors are much more than just rhetorical flourishes or poetic devices used to embellish language. They actually represent core mechanisms in human cognition that allow us to conceptualise abstract, complex ideas by mapping them to more familiar, concrete domains of experience.

Both analogy and metaphor benefit learning in several other ways. For example, due to their deep integration into the human imagination, metaphors and analogies enhance the students' conceptual understanding of a subject matter (Landau et al., 2010; Sternberg, 1990). For example, it has been argued that metaphorical projection is critical to the construction of semantic representations (Jamrozik et al., 2016; Levin, 2019). Analogies and metaphors enhance learning by fostering deeper understanding and knowledge retention and activate existing knowledge schemas, allowing students to map them onto unfamiliar concepts (Holyoak & Gentner, 1994). In educational contexts, metaphors and analogies are therefore pivotal drivers of sense-making, given their potential to aid individuals in overcoming cognitive unfamiliarity and novelty (Cornelissen & Clark, 2010; Sillince & Barker, 2012; Tourish & Hargie, 2012).

The concept of ‘analogical reasoning’ (Forbus, 1997; Gentner & Smith, 2012) is key to understanding how analogies and metaphors enable effective learning of abstract concepts especially because the concept shows that analogies map novel concepts onto familiar concepts, aiding the learning and transmission of novel information (Duit, 1991). Analogical reasoning/thinking is a purposeful process of representing information and objects in the world as interconnected systems of relationships and a key mechanism for creating connections and transferring inferences between disparate concepts (Green et al., 2010; Lu et al., 2012). In essence, analogical reasoning involves the “importation of knowledge from a well-known source onto a less-well-known target by the establishment of correspondences between the two” (Blanchette & Dunbar, 2001, p. 730).

Intertwined with the concept of analogical thinking/reasoning are domains of analogical encoding, analogical mapping, and relational reasoning, and its subprocesses of representation, retrieval, adaptation, and induction (Holyoak & Monti, 2021). This relational capability of analogies and analogical reasoning including mapping are illustrated in Figure 3.

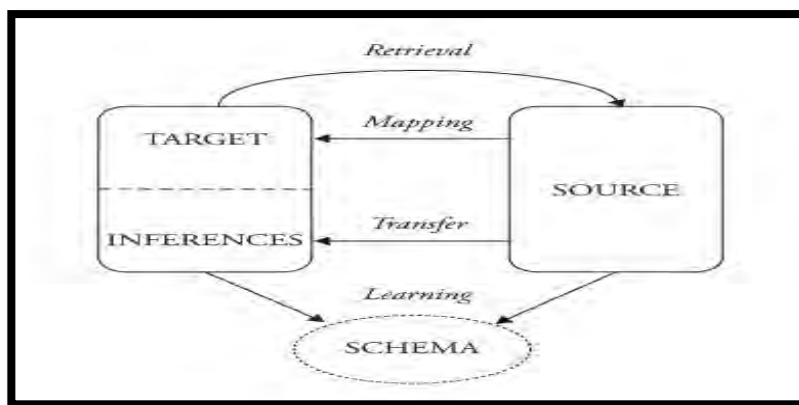


Figure3: Major components of analogical reasoning.
Source: Holyoak, 2012, p.236

Figure 3 demonstrates the concept of analogical reasoning /thinking and its subprocess of encoding, mapping, and relational reasoning (Jonassen, 2010; Gentner, 1983).

From a strategic management learning perspective, the activities involved in the analogical domain of ‘mapping’ or “the construction of orderly correspondences between the elements of a source analogue and those of a target” (Holyoak & Thagard, 1989, p.295) resemble the strategic management process because both emphasise ‘structural alignment’ or ‘structural consistency’ between two representations based on their common relational structure (Gentner & Forbus, 2011). Empirical evidence supports the idea of ‘structural consistency’ in the processing of analogising (Krawczyk et al., 2005; Markman & Gentner, 1993a; 1993b; Spellman & Holyoak, 1992). Structural consistency is also inherent to the strategic management process in that every step of the strategic management process logically feeds into the next one Analogies can therefore help students develop skills that enable them to understand the importance of synergy and interconnectedness among all steps of the strategic management process, which is necessary to achieve strategic fit.

Similarly, relational reasoning, which is fundamental to complex problem-solving (Gentner, 2016; Holyoak, 2012; Dumas, 2017), and is described as the ability to discern meaningful patterns within information streams (Alexander et al., 2016, p. 119), highlights the unique potential of analogy and metaphor in enhancing learners’ reasoning abilities. By engaging learners in situations that require them to make connections, recognize patterns and similarities, these tools promote higher order thinking such as critical analysis, synthesis, and evaluation (Gray & Holyoak, 2021; Holyoak & Cheng, 2011).

In the process of highlighting commonalities, analogies also highlight differences and hence encourage new approaches and novel solutions to problem resolution (Gentner & Markman, 1997). When comprehending unfamiliar concepts through analogy use, there is a deliberate transfer of knowledge across diverse domains (Ferguson & Forbus, 1998; Gick & Holyoak, 1983) although with metaphors, ideas from “semantically distinct domains” (Holyoak, 2005a, p. 120) merge to generate novel emergent meanings (Cornelissen, 2004). Through this juxtaposition and comparison, learners come to focus more on the alignments between the underlying relations of the examples being compared, facilitating abstraction of the shared patterns (Christie & Gentner, 2010; 2014; Gentner & Kurtz, 2006; Gentner & Loewenstein, 2002). In this respect, research indicates that when learners compare multiple cases or examples side-by-side, they develop generalized problem-solving schemas emphasizing common relational structures over superficial similarities (Gick & Holyoak, 1983), thereby extending comprehension beyond surface features (Evans & Evans, 1989; Loewenstein et al.,(1999) Pollack, 2015; Thibodeau et al., 2017).

Analogical and metaphorical reasoning (Gentner et al., 1997; Mars, 2021), encoding, and mapping do not only promote the abstraction of schemas (Gentner, & Colhoun, 2010), which in turn help students to recall and transfer learned information and problem-solve, but they also enable students to make sense of multifaceted phenomena beyond direct tangible experience (Gentner & Markman, 1997). This helps scaffold learning by linking abstract or unfamiliar ideas to concrete examples that are more accessible. Metaphors for example, provide a framework for linking concepts that we understand concretely with the more abstract ones (Wegner & Nuckles, 2015; Wegner et al., 2020). In this role, metaphor functions as a core cognitive tool for making meaning of the world, allowing learners to understand new concepts by comparing them to more familiar ones, mapping meaning from the source domain onto the target domain (Hey et al., 2008; Lakoff & Johnson, 1980a, 1980b). However, it is important to note that metaphors do more than simply point out surface similarities - they highlight deeper connections, mapping inferential structure and eliciting emotional responses in addition to mere attributive features (Kittay, 1987). In this way, metaphors facilitate comprehension on logical, experiential, and affective levels (Wharton & Saussure, (2020). This process of mapping, connecting and distinguishing pushes learners to think more deeply about relationships between ideas (Gentner & Maravilla, 2018). Both meaningful analogies and evocative metaphors therefore remain important linguistic devices for conveying unfamiliar ideas (Aubusson et al., 2009; Mayo, 2021).

It is because of these domains of analogical encoding, mapping and relational reasoning that several studies have argued that analogies and metaphors are effective tools for promoting student self-regulated learning - the process where learners take

greater ownership over their learning by setting goals, employing strategies, monitoring comprehension, and regulating motivation and behaviour (Panadero, 2017; Zimmerman, 2002). It is argued that analogies allow students to actively connect new concepts to existing knowledge frameworks, facilitating the integration and schema development integral to self-regulated learning (Ceccacci-Sawick et al., 2023). In this way, analogies and metaphors provide scaffolding to enable self-regulated comprehension of complex concepts (Gentner, 2022).

Analogies and metaphors can also promote self-regulated learning by stimulating interest and engagement through their vivid and relatable nature (Watkins, & Guihen, 2018; Orgill & Bodner, 2004;2006). In this way analogies aid in the transfer of knowledge by leveraging familiar concepts to understand unfamiliar ones (Hespos et al., 2020). It is therefore argued that analogies and metaphors can help students to learn to adapt, improvise, and think creatively, and strengthen their self-regulatory muscles with each hurdle overcome, mirroring the adaptability and resilience demanded by modern day businesses (Glynn, 2008; Gentner & Clement, 1988; Thibodeau & Boroditsky, 2011; 2013).

Employing analogies is therefore instructive in connecting everyday life experiences to abstract and intricate scientific concepts (Brand et al., 2021; Glynn, 1991). As powerful tools of inductive reasoning (Gray & Holyoak, 2021), analogies and metaphors, serve as building blocks for shaping the very realities of organisations and their social contexts (Lakoff & Johnson, 1980). Gentner et al., (2003) argue that analogical encoding focuses learners on precisely those aspects that generalize across cases. This explains why analogies have been successfully integrated into discovery learning (Kolodner, 2002a, 2002b, 2002c). Their ability to spark interest, build connections and stretch thinking makes them powerful educational and instructional tools.

7. Leveraging the Medical Analogy to Teach Strategic Management

Analogies and metaphors are commonly used in teaching and learning. For example sports analogies for team dynamics and strategic decision-making (Keiser et al., 2014; Palozzi & Lindo, 2018), nature analogies for organizational interconnectedness (Begon et al., 2006; Dukes & Mooney, 1999), culinary analogies for strategic planning in hospitality (Wright, 2014), and human body structure metaphors for overall success (Morgan, 1997). However, the most prevalent metaphor in Strategic Management studies is the analogy of war and the military, (Sun, 1994; Chu & Tse, 1992) which illustrates adaptability and decisive leadership essential for strategic success, including all of Mintzberg's Five Ps of strategy - plan, ploy, pattern, position, and perspective (Mintzberg, 2007).

As captured already, cognitive theories posit that students build connections between concepts and representations by mapping visual features to meaningful referents (Ainsworth, 2006; Schnotz, 2014). The medical analogy presented in the study potentially makes complex concepts more tangible and relatable and help students to understand the key stages of strategic management process including the importance of judicious selection of tools of strategic analysis. Additionally, the medical analogy is likely to be successful in promoting student-centred learning as well as develop students' critical employability 21st century skills/competences (Lippman et al., 2015). As argued by Freud, "Analogies, it is true, decide nothing, but they can make one feel more at home" (1933, p.182).

7.1. Stage 1- Diagnosis and Assessment

In medical practice, a thorough assessment of a patient's symptoms, history, and diagnostics is essential for accurate diagnosis. Strategic management operates on a similar principle, where managers evaluate the organization's internal and external environments to uncover challenges and opportunities (Tribe, 2016). Within this medical examination analogy, an organization's mission and values serve as its personal history and background. This information provides vital context for strategic diagnosis and 'treatment' planning. Just as doctors consider a patient's past conditions and lifestyle, examining an organization's vision, mission and values serves a critical purpose. Values act as a key component of the organization's perspective on strategic direction (Williams, 2010), and vision 'signals what an entity would like to become' (Tribe, 2016, p.25), whilst mission 'sets out in more concrete terms the general aims of an entity, what it is trying to achieve and what it is in existence for' (Tribe, 2016, p.25). As succinctly asserted by Selznick,

In defining the mission of the organization, leaders must take account of (1) the internal state of the policy: the strivings, inhibitions, and competences that exist within the organization, and (2) the external expectations that determine what must be sought or achieved if the institution is to survive. (1957, p. 62).

Therefore, just as a doctor might identify inconsistencies or gaps in a patient's medical history, analysing an organization's mission/vision can reveal dated elements or misalignments. These discrepancies deserve further investigation and potential revisions to ensure the mission/vision accurately reflects the current strategic direction. This process mirrors a doctor updating a patient's medical history for precision and relevance. Therefore, the mission/vision and values analyses provide crucial context that frames the strategic 'diagnosis' in the same way a well-documented medical history frames a clinical diagnosis.

7.2. Stage 2- Physical Examination: Strategy Analysis

At this stage, physical examination can be both internal and external depending on the nature of the strategic management challenge. In healthcare, a thorough diagnosis hinges on diverse tests that illuminate a patient's internal and external state. Similarly, effective strategic analysis for organizations relies on a suite of analytical tools to holistically gauge their health and prospects. Analogous to a comprehensive medical assessment, examining an organization's core competencies, value chain, competitive position, and resources forms the foundation of this strategic 'examination'. Here, internal analysis explores the organization's DNA, utilizing tools like 'SWOT', 'VRIO' (Barney,1991; 1995), Product Life Cycle, Value Chain Analysis (Porter, 1985), and the BCG Matrix to illuminate its strengths, weaknesses, and resource allocation. Externally, tools like

PESTLE, 'Porter's Five Forces' (Porter, 2004), and the '7S Framework' (Njeru et al., 2017) act as environmental 'scans', dissecting macro trends, competitive landscapes, and socio-economic, political, legal, and environmental influences that exert pressure on the organization. This holistic approach ensures that not only are immediate concerns addressed, but also their systemic roots within the broader business environment are identified and navigated, leading to a more sustainable and resilient organization. At this stage, like a toolbox overflowing with specialized instruments, having access to numerous strategic frameworks can be overwhelming. The indiscriminate application of every available tool might obscure the true nature and severity of the challenge rather than illuminate it. Just as a doctor would not use the same tools for every patient or for every ailment, strategists should not use the same analytical tools for every organisational challenge.

7.3. Stage 4- Making a Diagnosis: Strategic Analysis

This stage involves identifying the core strategic issues or 'diseases' afflicting the organization based on synthesized analysis. The diagnosis stage in the strategic management process closely mirrors the diagnosis phase in medicine, whereby physicians analyse symptoms, tests, and other data to determine the precise illness affecting a patient. This allows doctors to label the disease and design targeted treatment plans (Huda, 2019). Strategists play a comparable role in making a strategic diagnosis by identifying the core organizational 'diseases' based on synthesized analysis of internal and external data, qualitative inputs, and investigative findings. This parallels a doctor piecing together medical evidence to diagnose the condition causing a patient's symptoms.

Strategists, like physicians, require an ability to compile evidence and consider potential causes when deducing diagnoses (Roberts & Kay, 2022). By naming the specific strategic issues, the diagnosis provides a targeted focus for solutions, just as a medical diagnosis gives doctors a defined condition to treat. The strategist's expertise and judgement, mirroring the physician's skills, are crucial in linking findings to determine the organizational 'diseases'. Overall, the diagnosis represents a key step in identifying issues to address, in both medicine and strategy.

7.4. Stage 5- Prognosis

Once the diagnosis is established, the next step involves forecasting potential outcomes and identifying possible future states. The prognosis stage of the strategic management process aligns with a doctor's assessment of a diagnosed illness and its likely progression and outcomes for the patient. Just as physicians predict potential disease trajectories based on past cases and medical knowledge, strategists forecast likely scenarios and outcomes for the organization based on analysis and intuition. Doctors outline potential future health scenarios for a patient, ranging from the most favourable outcome to the least desirable, based on plausibility. Similarly, strategists consider a range of potential futures the organization might face, often through 'scenario planning' (Bowen & Bowen, 2014) exercises. Both doctors and strategists aim to predict overall impacts on the patient's health and wellbeing in medicine, and on organizational performance, capabilities, and competitiveness in business. However, uncertainty remains in both fields. Despite their expertise, doctors cannot foresee exactly how a disease will progress, just as strategists cannot fully predict precisely how the future will unfold. However, the prognosis represents the strategist's best attempt to foresee potential impacts on the organization, just as the physician's prognosis represents their best prediction for the patient's health.

7.5. Stage 6- Proposing Treatment Options: Strategic Choice and Implementation

Designing a treatment plan for the diagnosis equates to formulating a strategic plan tailored to the organizational challenges and context. Analogised to strategic management, this stage involves developing alternative courses of action to address strategic issues and recommending optimal solutions. Strategists develop action plans and implement specific approaches to address the identified challenges. Tools like resource allocation models (Okumus (2002), competitive analysis frameworks, play a crucial role in crafting effective treatment plans (Porter's (1985) generic strategies are also useful here and so is Ansoff Matrix (Ansoff, 1965). Other strategies to be applied can include franchising (Lashley & Morrison, 2000), diversification (Tribe, 2016), and blue ocean strategy (Kim, & Mauborgn, 2015). These strategies can be corporate level, business unit and/or functional (Tribe, 2016; Evans, 2019). Medical professionals devise treatment plans tailored to the patient's diagnosis. Likewise, in strategic management, students should be taught how to choose analytical models, concepts, and tools aligned with their diagnosis to formulate effective strategies for organisations.

7.6. Stage 7: Managing Patient Lifestyle: Strategic Control, Monitoring and Evaluation

Just as doctors schedule regular check-ups to track patient health after prescribing treatment, allowing them to spot issues early and adjust medications, organizations must continuously monitor strategy implementation through key performance indicators to identify deviations and make corrections. Strategic control involves monitoring vital financial metrics, market share, customer satisfaction, and employee productivity, similar to how physicians track indicators like blood pressure and cholesterol. Diligent tracking over the long-term, along with patient and employee feedback, helps both doctors and managers optimize treatments and strategy. Careful monitoring is vital in medicine and management for rapid adjustments to realign with the patient's health profile. Monitoring allows for timely identification of any adverse effects, therapeutic failures, or the need for dosage adjustments to medications. In the medical field a medication management plan (MMP), or pharmaceutical care plan is often used in the continuity of medication management across the continuum of care (Ogle et al., 2015). In strategic management, as argued by Wheelen et al., (2018) assessing strategy effectively requires more than just pinpointing performance discrepancies from the plan; it also entails comprehending the root causes behind those discrepancies. The control stage that follows implementation therefore involves analysis of key performance indicators (KPIs) such as financial performance, market share, customer satisfaction, and operational efficiency, measuring actual performance against strategic targets and benchmarks,

analysing the root causes of any deviations or failures, and taking corrective actions to realign the strategy and execution with desired outcomes.

8. In Defence of the Familiarity and Utility of the Medical Analogy in Student Centred Learning

It might be argued that the educational utility of the medical analogy is compromised in that most students are likely to be unfamiliar with the specialised field of medicine. While students may lack direct experience in the medical field, they are regularly exposed to medical metaphors and scenarios through popular media, making some medical processes familiar and accessible (Brewer & Ley, 2021; Brewer & Ley, 2010; Dudo et al., 2011). Popular medical TV shows like ‘Grey’s Anatomy’, ‘House’, ‘ER’, ‘Scrubs’, ‘The Good Doctor’, ‘Chicago Med’, ‘New Amsterdam’, and ‘The Resident’ often depict doctors engaging in medical questioning, weighing differential diagnoses, and mapping treatment plans, ingrained viewers with ‘the framing of medical diagnosis and treatment’ (Rosenberg & Golden, 1992). Additionally, most students have likely had previous personal experience visiting doctors’ offices, undergoing diagnostic questioning about symptoms, and determining appropriate treatment, even if they do not grasp the full technical details. Moreover, self-medication with over-the-counter medicines is a common practice (Blenkinsopp & Bradley, 1996; Fainzang, 2016; Makowska et al., 2020; Rodrigues, 2020), suggesting familiarity with matching medication to ailments.

Even if it were true that the medical analogy is too foreign or too technical for the students of strategic management to decipher, the counterargument is that analogies work even when participants lack detailed background knowledge of the source analogy, as the process focuses on mapping relational structure rather than surface features (Gick & Holyoak, 1980; 1983; Gentner & Toupin, 1986). The core roles and reasoning involved in medical diagnosis can therefore be mapped to strategic analysis without requiring medical expertise.

Additionally, in the era of artificial intelligence, the medical metaphor offers students a chance to ethically use Artificial Intelligence applications such as, *inter alia*, Perplexity AI, ChatGPT, GEMINI AI, to generate medical interview scripts to role play and illuminate the strategic management issues. Students can role-play as doctor/nurse and patient, developing scripts for the medical interview using such technology. This exercise mirrors strategic management’s interrogation of business environments, emphasizing analogical mapping’s teaching value (Gentner & Forbus, 2011).

It can also be argued that the analogy between strategic management and medicine offers insight into authentic learning, as both fields require grappling with complex, real-world challenges demanding sustained, collaborative effort. Authentic learning allows students to explore concepts and relationships through relevant, real-world problems (Donovan et al., 1999; Herrington, 2014; Herrington et al., 2002). It involves tasks like complex problem-solving, inquiry, collaboration, reflection, and interdisciplinary knowledge application (Lombardi & Oblinger, 2007). Analogy and metaphor as authentic pedagogical tools provide opportunities for intentional learning by thinking and acting like professionals addressing real strategic problems (McTighe, 2010). Casting students as ‘organizational doctors’ leverages an authentic professional context for strategic analysis, diagnosing and treating organizational ‘patients’ as real strategists would. Students address ill-defined problems, research, apply analysis tools to identify root causes, and evaluate strategic ‘treatments’, fostering intentional learning by engaging with strategic management’s inherent complexities and ambiguities. This activity fosters learning with intention, allowing students to engage with complexities and ambiguities inherent in strategic management by directly adopting the mindset and actions of professionals in the field.

One of the characteristics of authentic learning is its collaborative nature, providing opportunities for collaboration (Herrington & Oliver, 2000; Herrington et al., 2002). This aligns well with strategic analysis, an inherently collaborative, interdisciplinary process requiring consultation with diverse organizational stakeholders when assessing ‘symptoms’. The open-ended medical metaphor allows students to reflect, synthesize their analysis into polished presentations and reports, applying multidisciplinary knowledge. This analogy also presents opportunities for reflection. Reflection is critical in authentic learning environments (Herrington, 2009; Herrington et al., 2014; Lombardi, 2007; Rule, 2006), enabling individuals to explore experiences and gain new understandings (Boud et al., 2013). The medical analogy provides students an opportunity to reflect on analyses and solutions emerged during analogical reasoning and mapping and present counter narratives or perspectives. As defined by Brookfield (2017), reflection is the act of seeking out and critically evaluating assumptions that form the basis of a practice and, if warranted, challenging them by considering and presenting opposing viewpoints. Reflection is integral to authentic learning because authentic activities allow competing solutions and diversity of outcomes (Bohemia & Davison, 2012), aligning with the medical analogy’s opportunity for students to examine tasks from different perspectives using various resources, a characteristic of authentic learning (Herrington, 2014).

Finally, presenting findings of the diagnosis requires utilizing professional language and communication suited to diverse stakeholder groups, building valuable skills. It is argued that the point of education is to improve the quality of the meanings we construct, or to help students ‘use their minds well’ (Sizer, 1984). By mimicking the actual messy process of strategic analysis, the medical analogy provides an authentic learning experience that equips students with transferable real-world skills in research, collaboration, critical thinking, problem-solving, communication and creativity and other transferable real-world skills. It is argued that analogy is the ‘core of creativity’ (Hofstadter & Sander, 2008).

9. Conclusion

In conclusion, this study has explored the potential of analogies and metaphors, particularly medical analogies, as pedagogical tools to enhance student understanding of abstract strategic management concepts. The findings suggest that these tools can make abstract ideas more relatable, systematic, and data-driven, ultimately fostering deeper learning and critical thinking skills (Gentner 2014; Gentner & Hoyos, 2017). Metaphors and analogies are deeply woven into the fabric of human language and thought. These figurative devices play a vital role in how we comprehend and communicate about the world around us. By drawing parallels between the familiar and the unfamiliar, metaphors and analogies allow us to leverage our existing knowledge and experiences to make sense of new or complex phenomena. They act as cognitive bridges, enabling us to connect the known to the unknown. This bridging function is crucial, as it allows us to develop our understanding of the world in an intuitive and accessible way. Rather than grappling with abstract or opaque concepts in isolation, we can relate them to more tangible reference points that we already understand. Beyond just aiding individual comprehension, these figurative tools also facilitate the exchange of ideas between people. By couching new or complex notions in terms of the familiar, we can more effectively communicate our thoughts and perspectives to others. Moreover, analogies and metaphors align well with the current emphasis on authentic learning and integration of twenty-first century skills into education, providing opportunities for student-centred learning and the development of essential competencies. The medical analogy and metaphor therefore present a compelling framework for teaching strategic management. Finally, research is required to explore the impact of using analogies and metaphors on student learning outcomes and to investigate their effectiveness across diverse educational contexts and disciplines. Additionally, examining the potential challenges and limitations associated with these tools would provide valuable insights for educators seeking to incorporate them effectively into their teaching practices.

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