Improving Case-Based Learning with Clear Content and Simple Presentation

Lauren N. Harkrider
Kenexa, an IBM company

Zhanna Bagdasarov
The University of Oklahoma

Alexandra E. MacDougall
The University of Oklahoma

James F. Johnson
The University of Oklahoma

Lynn D. Devenport
The University of Oklahoma

Michael D. Mumford
The University of Oklahoma

Although cases are frequently used in business education, little is known about how the content and presentation of cases influence learning and performance. This article overviews eight studies which empirically tested how specific content as well as processes for working through case material influence case-based learning and transfer. Overall, these studies reveal the importance of structuring cases in a manner that simplifies learning, clearly emphasizing key concepts within the case content and concisely presenting case material as to focus attention on learning underlying principles useful in future situations. The direct implications for improving the effectiveness of case-based learning are discussed.

INTRODUCTION

Case-based learning has become a staple in the business school curriculum, with one program noting students analyze over 500 cases during their Masters of Business Administration studies (Garvin, 2004). These cases provide complex, real-world contexts to practice and apply a range of business principles, including finance (Correia & Mayall, 2012), management (Greenhalgh, 2007), information systems (Benbasat, Goldstein, & Mead, 1987), and marketing (Beverland & Lindgreen, 2010). By providing realistic problems, students can practice relevant skills and decision-making in a risk-free environment (Richardson, 1994), causing case-based learning to frequently prove more effective than lecturing in business disciplines (Bocker, 1987).

This widespread use of cases leads to extensive variety in both the content of cases and the processes by which students work with case material; however, several common themes emerge. With regard to general content, Garvin (2004) argues "less is more," stressing the need to focus each case on only a few key principles. Despite suggestions to simplify content, many cases remain fairly lengthy (Richardson, 1994), with "brief" cases still including 5-8 text and 3-4 exhibit pages (Garvin, 2004). Some cases even extend over an entire semester (Walker, 2009). In addition to being lengthy, most cases describe realistic business contexts which mirror the "complexities and ambiguities of the practical world" (Barnes, Christensen, & Hansen, 1994, p. 44). Although the realistic contexts simulate today's work environment and provide opportunities to practice forecasting effects of multiple courses of action (Greenhalgh, 2007), the content can become highly ambiguous, failing to explicitly state key guidelines in the content and making it difficult to identify and recall principles buried within cases (Kolodner, 1993).

Additionally, most cases include a variety of distracting, irrelevant information (Kim et al., 2006). Similar to actual business situations, the distracting information provides practice at deciphering between pertinent and non-pertinent facts (Garvin, 2003). Because the key causes are often hidden rather than clearly emphasized, however, students can sometimes misidentify key causes, limiting the effectiveness of case-based learning and problem-solving (Johnson et al., 2012). Case content is also generally loaded with facts and quantitative data to promote analysis (Currie & Tempest, 2008). In fact, Greenhalgh (2007) describes cases as "neutral descriptions of real-life business problems" (p. 181). Although facts facilitate logical analyses, most cases are overly rational and devoid of human emotion (Liang & Wang, 2004). Finally, most cases include no outcomes or only positive outcomes due to senior management biases (Currie & Tempest, 2008); rarely does case content explicitly describe negative case outcomes (Johnson et al., 2012).

Besides the content, cases can also differ in terms of how they are presented, altering the processes by which students work with case material (Herreid, 2011). Many programs present one case per learning objective (Garvin, 2003), providing either open-ended questions or highly structured prompts to facilitate case analysis (Schmidt, Rotgans, & Yew, 2011). Other presentation recommendations include chunking or segmenting cases into pieces to gradually disclose content (Kim et al., 2006), allowing students to generate their own cases (Currie & Tempest, 2008), or encouraging elaboration on a provided case (Bagdasarov et al., 2012a).

Benefits of Case-Based Learning

Despite the variations in the content and processes by which students work through cases, case-based learning generally offers many benefits. First, learners report positive reactions, finding cases motivating, enjoyable, and useful (Setia et al., 2011) as well as engaging and satisfying (Kim et al., 2006). Second, cases facilitate the development of domain-specific knowledge that may be generalized and applied to novel situations (Hammond, 1990). Given this, cases offer vicarious experiences for students to develop requisite business knowledge (Atkinson, 2008). Case-based reasoning also promotes a number of cognitive reasoning processes including problem identification (Azer, Peterson, Guerrero, & Edgren, 2012), inductive and deductive reasoning, and critical thinking skills (Kolodner, Owensby, & Guzdial, 2004), which greatly facilitate sensemaking (Mumford et al., 2008). Sensemaking is a cognitive process that helps individuals navigate and make sense of ambiguous events (Weick, 1995). More specifically, it involves actively gathering, interpreting, and integrating information into a mental model (Mumford et al., 2008) to help better understand the situation and ultimately inform decision-making. By engaging in sensemaking, case-based learners often demonstrate better decision-making, especially in uncertain situations (Correia & Mayall, 2012).

Problems with Case-based Learning

Despite these benefits, case-based learning is not without its criticism (Stonham, 1994; Mumford, 2005). As noted by Brennan and Ahmad (2005), while business cases are realistic in their inclusion of complex and ambiguous scenarios, this may cause high anxiety among students, in turn decreasing satisfaction and engagement. Indeed, too much ambiguity and irrelevant information can reduce learning

of critical concepts (Correia & Mayall, 2012). Similarly, the process for working through case material is often ambiguous and unstructured, potentially resulting in suboptimal processing of case material (Correia & Mayall, 2012). Additionally, controversy exists concerning the effectiveness of case-based reasoning with regard to knowledge acquisition and transfer (Stonham, 1994), especially when learners focus solely on extraneous, case-specific details (Loewenstein, Thompson, & Gentner, 2003).

One reason why cases may not always promote knowledge acquisition and transfer is due to the complexity inherent in case-based knowledge structures (Aamodt & Plaza, 1994). There are many ways to structure the content and presentation of cases to encourage knowledge acquisition and transfer, with some methods resulting in more effective outcomes than others. Thus, a question is raised concerning what aspects of case content should be emphasized and what processes for presenting case material are most effective. In fact, there is a call for more empirical research to understand how best to construct and present case material to optimize case-based learning outcomes (Azer et al., 2012; Currie & Tempest, 2008; Kim et al., 2006).

Therefore, the purpose of this article is to overview eight studies which empirically tested how specific content and processes for working through case material influence case-based learning and transfer. Overall, these studies revealed the importance of structuring cases in a manner that simplifies learning. This can be achieved by clearly emphasizing key concepts within case content and by concisely presenting case material as to focus attention on learning underlying principles which can be generalized for use in future situations. These results have direct implications for improving the effectiveness of case-based learning.

EMPIRICAL EVIDENCE FOR IMPROVING CASE-BASED LEARNING

General Procedures

Sample

Participants for all eight studies were graduate students fulfilling a university-mandated Responsible Conduct for Research (RCR) training program - a case-based problem-solving course designed to promote better ethical decision-making. Participants represented a range of disciplines including social, biological, health, business, and engineering sciences, as well as humanities and performing arts.

Procedure

RCR training consisted of a two-day, 16-hour course. All empirical studies were embedded into the second day of training, lasting approximately 1.5 hours. Participants were randomly assigned to conditions when they received the first of two packets. This packet contained case material manipulated for either case content (e.g., affective vs. no affective content) or the processes by which case material was presented (e.g., comparing cases vs. sequential cases). After completing the first packet of manipulated case content or process materials, participants received a second packet of case-based effectiveness measures. Specifically, participants completed a satisfaction survey to assess reactions to the cases and a multiple-choice measure to assess case-based knowledge acquisition. Transfer of case-based knowledge was assessed through a low-fidelity decision-making task in which trainees read a new ethical case and responded to open-ended questions designed to elicit cognitive sensemaking processes (causal analysis, constraint analysis, forecasting), sensemaking strategies (see Appendix A), and decision-making. All responses were coded by four trained raters using criteria outlined by Mumford et al. (2008). In addition to assessing short-term decision-making, some studies also assessed far-transfer of decision-making through performance on a post training ethical decision-making measure occurring at the end of training (Mumford et al., 2006).

Case Content

Four experiments manipulating case content revealed content which clearly emphasizes social context, forecasting, guidelines, key causes, negative outcomes, and affective information improves case-based learning and transfer.

Social Context and Goal Focus

Because cases frequently include rich contextual details, Bagdasarov and colleagues (2012b) examined the influences of embedding clear information about the social setting and characters' goal focus on execution of sensemaking processes and overall decision-making. Employing a randomized between-subjects design, goals and social context were manipulated in a 2 (social setting: autonomy-supportive vs. controlling) x 2 (goal focus: promotion vs. prevention) experimental study, with a separate comparison group. The social setting was manipulated within two ethics cases to portray either an autonomy-supportive or a controlling laboratory environment. The autonomy-supportive environment reflected a laboratory where students worked in a comfortable atmosphere with their trusting supervisor, while a controlling environment was defined by exerting pressure on students via strict deadlines, potential punishments, and lack of guidelines and autonomy. Characters' goal focus was defined as either promotion- or prevention-seeking. Main characters portrayed in the case as promotion-seeking were in desperate need to attain positive outcomes, succeed, and gain their supervisor's approval. On the contrary, characters described as prevention-seeking yearned to prevent failure, circumvent angering their supervisors, and avoid losses at all cost. Findings of this study indicated that participants who read cases depicting autonomy-supportive social settings outperformed their counterparts on certain sensemaking processes (i.e., constraint and forecasting analyses) and overall decision-making. Goal focus, however, appeared to have a weak influence on the outcome variables, with only forecast quality benefitting from a description of prevention-focused goals. Goal focus did not affect participants' decision-making or execution of other important sensemaking processes. Ultimately, these findings suggest a clear need for cases to provide a rich and realistic description of the setting in order to promote engagement and interest on the part of the reader and to improve sensemaking processes.

Forecasting and Guidelines

Although the ambiguous nature of cases can facilitate forecasting (Greenhalgh, 2007), few cases explicitly provide forecasting information or relevant guidelines within the case content, despite the benefits of forecasting (Lonergan, Scott, & Mumford, 2004) and guidelines (O'Fallon & Butterfield, 2005) for improving decision-making. Therefore, Harkrider and colleagues (2012b) implemented a 2 (forecasting: short-term vs. long-term) × 2 (guidelines: guidelines only vs. guidelines within context) between-subjects design with a fifth control condition to test how case content influences learning and transfer. Forecasting content was manipulated to either include potential short-term forecasts, focusing on outcomes possible in a few weeks (e.g., meeting external deadlines), or long-term forecasts, focusing on outcomes possible in distant years (e.g., future lab funding). Guidelines included either guidelines only, mentioning a university guideline helpful for decision-making (e.g., fabrication rules), or guidelines within context, including the same guideline with additional situational information explaining why the guideline is pertinent (e.g., false results harm public). The control group's cases did not have explicit forecasting or guideline content.

As predicted, results revealed cases with forecasting content led to significantly greater knowledge acquisition and sensemaking strategy use compared to cases without forecasting content. Compared to no guidelines, cases including guidelines showed significantly greater knowledge acquisition, sensemaking strategy use, and better decision-making on a transfer task. Because forecasting and guidelines are underlying principles applicable in most cases, content clearly emphasizing these concepts may have facilitated encoding and indexing based on these generalizable features, resulting in easier recall in a transfer situation (Kolodner, 1993). A significant interaction between forecasting and guidelines was also found. When content included short-term forecasts, guidelines only led to higher satisfaction and sensemaking strategy use than when guidelines were embedded within context. The additional contextual information may have only distracted trainees from recognizing how to directly apply the guidelines in the immediate situation (Bommer, Gratto, Gravander, & Tuttle, 1987). When forecasting long-term, guidelines within context compared to guidelines only yielded greater satisfaction and strategy use; contextualizing the guidelines provided insight regarding how to apply the guidelines given the complex,

future situations considered (Bommer et al., 1987). Overall, these results suggest cases should include forecasting and guidelines content to improve learning and transfer.

Key Causes and Negative Outcomes

Existing literature recommends that a "good" case seeks to promote clear cause-and-effect reasoning in case content; however, such recommendations been subject to little empirical scrutiny (Kolodner et al., 2004). Additionally, research findings demonstrate that novice problem-solvers tend to produce overly-optimistic forecasts while experienced problem-solvers are better at identifying potential constraints and contingencies (Xiao, Milgram, & Doyle, 1997). In contrast, Stenmark et al. (2011) demonstrated that examining *both* positive and negative outcomes may provide a more holistic, complete picture and that important causal information in a case promotes forecasting and problem-solving performance (Stenmark et al., 2010). To better delineate the importance of causal and outcome information, Johnson et al. (2012) implemented a 2 (cause complexity: high vs. low) × 2 (outcome valence: negative vs. mixed) between-subjects design with a fifth comparison condition to test how case content influences learning and transfer. Cause complexity was manipulated by providing different amounts of cause content in each condition: low cause complexity contained three causes while cases with high cause complexity contained seven. Outcome valence content was defined as whether case outcomes were negative or mixed (e.g. positive and negative) and was manipulated by presenting participants with either four negative outcomes or two negative and two positive outcomes.

Study results indicated that participants in the low cause complexity condition produced longer, higher quality forecasts, a skill shown to be hampered when presented with an overwhelming amount of competing, causal information (Mumford, 2003; Stenmark et al., 2010). Additionally, these individuals produced significantly more negative forecasts, a strategy more characteristic of experienced case-based problem solvers (Xiao et al., 1997). Results for outcome valence indicated that participants given negative outcomes performed better than mixed-valence case content, identifying more causes and more critical causes/constraints. Finally, participants who received negative case content performed significantly better on a far-transfer measure of decision-making, meaning that exposure to negative outcomes resulted in a long-term, sustained increase in decision-making performance over the remainder of the RCR case-based training course. Results from Johnson et al. (2012) indicate that (1) limiting causal content to critical, key causes and (2) including negative case content both have a significant, sustained impact on case-based problem solving performance and facilitates cause-and-effect reasoning in trainees.

Affect and Socio-Relational Context

Although cases are typically devoid of emotion, many researchers argue the inclusion of emotion content may improve case-based learning (Currie & Tempest, 2008; Gaudine & Thorne, 2001). Additionally, elements such as socio-relational context (e.g. interpersonal relationships, norms, and expressions) are important to provide a realistic, descriptive setting for emotion content to take place and may impact how emotional content is processed and responded to (Van Kleef, 2009). Thiel et al. (2011) investigated the influence of emotional and socio-relational content embedded within cases with a 3 (cause emotional content: primary actors vs. secondary actors vs. no emotional content) × 2 (socio-relational power: present vs. absent) between-subjects design. Results demonstrated that individuals acquired more case-based knowledge when descriptions of case characters' emotional experiences were included for both primary and secondary characters, regardless of socio-relational content. Participants who read cases with emotional content performed better on sensemaking processes (identification of critical causes/constraints and forecasting quality) and decision-making performance. Ultimately, Thiel et al. (2011) demonstrates that case content has a significant effect on case-based knowledge acquisition and problem-solving ability, and suggests a need for cases to include realistic, emotionally evocative case content.

Case Presentation

Four experiments manipulating case presentation revealed presenting cases in a manner which simplifies the process for working with case material improves learning effectiveness.

Elaboration and Writing of Cases

In a study investigating the unique and joint effects of two prominent instructional strategies (i.e., elaboration and writing of cases), Bagdasarov et al. (2012a) tested the usefulness of these pedagogical techniques on knowledge acquisition, execution of sensemaking processes and strategies, and overall performance on a decision-making task. Elaboration "involves meaning-enhancing additions, constructions, or generations that improve one's memory for what is being learned" (Levin, 1988, p. 191) and is touted by researchers for the positive effects it has on learners' critical thinking, retention of information, and comprehension (Hamilton, 1999; Reder, 1980; Willoughby, Wood, McDermott, & McLaren, 2000). Writing of cases is another technique used by educators and stems from the "writing-to-learn" literature. This literature suggests that a simple act of writing is highly powerful and conducive to general learning purposes (Hand & Prain, 2002; Rivard, 1994; Stewart, Myers, & Culley, 2010). Given the documented benefits of both techniques, Bagdasarov and colleagues (2012a) conducted a study having participants either (1) elaborate on a given case, (2) write their own case, (3) elaborate on their own case, or (4) write a brief response to a given case (control condition). Findings of this work consistently showed that participants who elaborated on a given case and those in the control condition outperformed the rest of the groups on all outcome variables. Additionally, participants who wrote and elaborated on their own cases produced the poorest results, suggesting that the task was too cognitively taxing. Thus, it appears that if asked to elaborate, learners should be given a well-written, structured case for analysis.

Case Comparisons and Structured Prompts

When cases are encoded based on details salient to a particular case rather than generalizable principles, recall and applications of lessons learned to new situations become difficult, reducing the effectiveness of case-based learning. Two methods for structuring case presentation, case comparisons and structured prompts, however, can reduce encoding and recall difficulties by focusing attention to and indexing of generalizable principles (Loewenstein et al., 2003). Harkrider et al. (2012a) used a 2 (case presentation: sequential vs. comparison) × 2 (prompts: unstructured vs. structured) between-subjects design to test the effects of case presentation on knowledge and transfer. Students read two counterbalanced cases either sequentially or simultaneously. The unstructured prompt was open-ended, asking students to identify important aspects of the situation, whereas structured prompts asked students to identify five underlying principles (e.g., causes, obstacles). Significant interactions were found such that some form of structure, either through comparing cases or structured prompts, improved effectiveness. Trainees were more satisfied, utilized sensemaking strategies more, and made better decisions when they compared cases using unstructured rather than structured prompts. When sequential cases were accompanied with structured rather than unstructured prompts, trainees displayed greater satisfaction and used more sensemaking strategies. When no structure guided learning (sequential cases with unstructured prompts), trainees were the least satisfied and used sensemaking strategies less. Because case material is complex, trainees may experience frustration when the learning environment fails to impose some structure that could reduce the difficulties with navigating these ill-defined problems (Kolodner, 1993). Trainees also lacked guidance on what aspects of the case they should encode (Loewenstein et al., 2003). Too much structure also proved problematic with the worst decision-making occurring when students compared cases using structured prompts. Overall, some structure should be used to simplify the presentation of case material.

Plot-Twists and Outcome Evaluation

In a follow-up of Bagdasarov et al. (2012a) and Harkrider et al. (2012a), and seeking to confirm previous findings for the need for case presentation simplicity, Peacock et al. (2012) examined two

alternative methods for case process presentation: presenting alternative case outcome scenarios and conducting structured outcome evaluation. Investigators implemented a 2 (alternative outcomes: present vs. absent) × 2 (structured outcome evaluation: present vs. absent) between-subjects design to test how case content influences learning and transfer. As hypothesized, and in accordance with previous findings calling for case presentation simplicity, Peacock et al. (2012) demonstrated that additional complexity (e.g., cases with alternative endings present) led to significant cognitive overload and general confusion compared to those who received the single, original case ending. Additionally, there was no significant difference found between structured and unstructured outcome evaluation. These findings have important implications for case presentation; specifically, novice case-based problem solvers are easily overwhelmed, be it due to case complexity, their lack of experience with case-based information, or both. Case-based instruction, especially for novices, should begin with clean, simple case exercises that cater to the abilities of the novice case-based problem solver. Increasing case complexity should only be introduced once a strong grasp of case-based fundamentals is acquired.

Incremental Case Building and Forecasting Outcomes

Learners must effectively identify structurally significant case aspects, as well as their interrelationships, in order to learn successfully from cases (Reimann & Schult, 1996; Loewenstein et al., 2003). Often, cases are presented in a complicated, incremental format which focuses learners' attention away from key case aspects to peripheral, case-specific details, distracting learners when encoding and indexing material (Gentner, Loewenstein, & Thompson, 2003). Additionally, incremental presentation of case material induces a high degree of cognitive demand via sequential analytical evaluation (Ford, 1999) which further detracts from effective learning. Despite its negative influence, incremental case building is still implemented in case-based domains (e.g., Kim et al., 2006). Accordingly, MacDougall and colleagues (under review) sought to examine the influence of incremental case building alongside a well-established instructional process, forecasting outcomes, using a 2 (incremental case building: present vs. absent) × 2 (forecasting outcomes: present vs. absent) between-subjects design. For incremental case building, learners either received an incrementally built case with three sequential builds, or they received the original holistic case. For forecasting outcomes, learners either responded to forecasting prompt questions or to one generic question.

Results revealed an interaction for reaction such that learners preferred one, but not both, instructional process at a time. Even more, results demonstrated that learners were highly dissatisfied with incremental case building and that they tended to forecast more short-term rather than long-term outcomes when presented with an incrementally built case. This finding supports the notion that incrementally presented material draws learners to superfluous case information relevant only to the present situation, as opposed to broader and more structurally significant case aspects (Pask, 1976). Additionally, while forecasting improved case-based knowledge acquisition, it decreased sensemaking processes. Taken together, it is plausible that the strong negative reaction towards incremental case building, along with the influence of multiple task performance (e.g., Meyer & Kieras, 1997) and capacity limitation (e.g., Duncan, 1980) limited learners in their processing of material so much that it not only hindered, but negated, the effectiveness of forecasting outcomes. Overall, it is essential to avoid high levels of cognitive demand in case-based learning interventions and to provide learners with enough structure, albeit not too much, to work through cases.

DISCUSSION

Limitations

Before turning to the broader implications, several limitations are important to address. First, the sample included graduate students from a range of disciplines rather than business students specifically. Master's and doctoral business students, however, were included in the sample, and there were no significant differences between graduate disciplines and case performance. Additionally, some results, such as the effectiveness of case comparisons, replicated findings found specifically on business

populations (Loewenstein et al., 2003). Although future research should examine whether these results apply specifically to a business population, the inclusion of business students in the sample and the replication of results suggests these findings will generalize to business students.

Second, all of these studies tested the effects of case content and presentation within an ethics domain rather than in a specific business context. Both the business environment and ethical situations, however, are characterized by complex, ambiguous, and ill-defined environments, suggesting the cases presented in these studies are similar to cases presented in other business disciplines (Thiel et al., 2012). Ethical decisions are also important in all business domains. In fact, Currie and Tempest (2008) suggest ethics is so important to business practices that all business cases should move beyond technical answers to also incorporate ethically and socially responsible decisions. Thus, the similarity between ethical and business contexts suggests these content and presentation recommendations should improve learning and transfer for not only ethical knowledge and decision-making but also other business skills. Third, although these studies examined an array of variables, future research should continue to examine how other content and presentation factors influence case-based learning. For example, these experiments focused on the self-study case-based learning although many case analyses include instructor-led or group discussions (Stonham, 1994).

Implications for Designing and Presenting Cases

Overall, the foregoing studies reveal the importance of structuring cases in a manner that simplifies learning, clearly emphasizing key concepts within the case content and concisely presenting case material as to focus attention on learning underlying principles useful in future situations. Besides promoting involvement and interest (Kim et al., 2006), cases should be carefully constructed, articulating key points within the content and presenting material in a manner which simplifies learning in order to improve case effectiveness. Although irrelevant information may mirror the complexities of the business world, too much irrelevant detail, failure to emphasize key content, and lengthy, confusing case presentations can overcomplicate the key principles and decrease learning and transfer (Abercrombie, 2011). These empirical studies provide several practical implications for designing and presenting business cases.

Content

The recently-conducted studies described earlier reveal the importance of clearly emphasizing key concepts when writing case content. Specifically, cases should explicitly include social context, forecasting, guidelines, key causes, negative outcomes, and affective content to improve satisfaction, knowledge acquisition, sensemaking, and decision-making. Several of the identified content attributes have already been incorporated into existing business cases and should continue to be emphasized. Specifically, a rich, realistic, and descriptive portrayal of the social environment is a highly important feature of every case (Atkinson, 2008). Providing readers with enough information to be able to conjure up an image of the setting where a certain situation transpired is essential (Bagdasarov et al., 2012b).

Aside from providing a detailed description of the social setting, recent evidence suggests that inclusion of forecasting information, guidelines, critical causes, negative outcomes, and emotion result in improved knowledge acquisition, enhanced execution of sensemaking strategies, and increased decision-making. Providing information regarding multiple potential consequences of action in cases is critical (Correia & Mayall, 2012). Considering multiple forecasts of probable outcomes allows a learner to better think through the situation, weigh the costs and benefits, and amend his/her chosen course of action if necessary (Harkrider et al., 2012b; Stenmark et al., 2010). Likewise, if the aim of a case is to relate information regarding appropriate or inappropriate behavior, it is particularly effective to emphasize specific guidelines (Harkrider et al., 2012b). Learners will encode the described guidelines and apply them when making decisions in future situations. Further, evidence regarding case content attributes illustrates the need for integration of critical causes and negative outcomes within cases (Johnson et al., 2012). Carefully delineating only the most important causes of the dilemma described in a case helps focus the reader's attention on the vital components of an issue, rather than the non-pertinent distractors. It is also useful for learners to read cases that highlight negative outcomes (Johnson et al., 2012). Currie

and Tempest (2008) noted that students should be provided with an opportunity to recognize that there are other potential outcomes than a positive representation of a "heroic" senior manager (p. 48). Finally, it behooves case developers to include emotional information in their materials (Thiel et al., 2011). According to Herreid (1998), cases that build empathy with the central characters are not only more engaging to readers, but they also aid in decision-making. Cases that are devoid of emotional information tend to be too rational and thus lack the necessary "human" aspects that augment realism (Currie & Tempest, 2008).

Presentation

Besides carefully constructing case content, instructors should also simplify the presentation of case material, providing structure to enhance learning and transfer. It is no surprise that working through a complex case is not only cognitively taxing, but it tends to frustrate students. In fact, Harvard Business Publishing even offers *The Case Analysis Coach*, an online program that claims to equip students with "key concepts required for the reading, analysis, and interpretation of business case studies" (Monro, 2012). Thus, the following recommendations are made to alleviate the frustration learners may experience when tasked with reading and understanding case material.

First, it is important to keep cases brief (Herreid, 1998). Cases that are too long tend to include a large amount of distracting information not conducive to learning (Kim et al., 2006). Second, elaborating on structured, well-written cases can promote knowledge acquisition, sensemaking, and decision-making (Bagdasarov et al., 2012a). Third, when presenting case examples, allow learners enough examples to permit comparison of cases. Comparing cases promotes indexing of generalizable principles, improves recall, promotes sensemaking strategy application, and enhances decision-making (Gentner et al., 2003; Harkrider et al., 2012a). Similarly, providing learners with structured prompt questions which highlight key concepts and aid in indexing and recall will improve learning and transfer performance (Lee & Bae, 2008). Finally, case developers should be wary of providing numerous alternative outcomes and describing several different issues within a single case (Peacock et al., 2012). Likewise, presenting cases to learners in increments is not effective (MacDougall et al., under review). Such techniques function to induce cognitive load and impede the facilitative mechanisms of sensemaking. Ultimately, simplicity and structure count when it comes to the case method.

CONCLUSION

Overall, the empirical evidence supports less is more when it comes to case-based learning. By simplifying and structuring case content and processes, students can improve learning and transfer of business skills, increasing the effectiveness of case-based learning.

ACKNOWLEDGMENTS

REFERENCES

Aamodt, A., & Plaza, E. (1994). Case-based reasoning: Foundational issues, methodological variations, and system approaches. *AI Communications, 7*(1), 39-59.

Abercrombie, S. (2011). *Examining the influence of seductive details in case-based instruction on pre-service teachers' learning and learning perceptions* (Doctoral dissertation). Retrieved from ProQuest Dissertations & Theses database. (UMI No. 3473131)

Atkinson, T. N. (2008). Using creative writing techniques to enhance the case study method in research integrity and ethics courses. *Journal of Academic Ethics, 6*, 33-50.

Azer, S. A., Peterson, R., Guerrero, A. P. S., & Edgren, G. (2012, May). Twelve tips for constructing problem-based learning cases. *Medical Teacher, 34*(5), 361-367.

Bagdasarov, Z., Harkrider, L. N., Johnson, J. F., Thiel, C. E., MacDougall, A. E., Devenport, L. D., Connelly, S., Mumford, M. D., & Peacock, J. (2012a). An investigation of case-based instructional strategies on learning, retention, and ethical decision-making. *Journal of Empirical Research on Human Research Ethics, 7*(4), 79-86.

Bagdasarov, Z., Thiel, C. E., Johnson, J. F., Connelly, S., Harkrider, L., Devenport, L. D., & Mumford, M. D. (2012b). Case-based ethics instruction: The influence of contextual and individual factors in case content on ethical decision-making. *Science and Engineering Ethics*. Advanced online publication. doi:10.1007/s11948-012-9414-3

Barnes, L., Christensen, C., & Hansen, A. (1994). *Teaching and the case method: Text, cases, and readings* (3rd ed.). Boston: Harvard Business School Press.

Benbasat, I., Goldstein, D. K., & Mead, M. (1987). The case research strategy in studies of information systems. *MIS Quarterly, 11*, 369-386.

Beverland, M., & Lindgreen, A. (2010). What makes a good case study? A positivist review of qualitative case research published in Industrial Marketing Management, 1971-2006. *Industrial Marketing Management, 39*, 56-63.

Bocker, F. (1987). Is case teaching more effective than lecture teaching in business administration? An exploratory analysis. *Interfaces, 17*, 64-71.

Bommer, M., Gratto, C., Gravander, J., & Tuttle, M. (1987). A behavioral model of ethical and unethical decision making. *Journal of Business Ethics, 6*, 265-280.

Brennan, R., & Ahmad, S. J. (2005). Using case studies in management education: The student perspective. *International Journal of Management Education, 4*(3), 21-30.

Correia, C., & Mayall, P. (2012, July). The use of the case method in teaching corporate finance: An evolution. In *International Conference on Information Communication Technologies in Education 2012 Proceedings*, Rhodes, Greece (pp. 535-547).

Currie, G., & Tempest, S. (2008). Moving towards reflexive use of teaching cases within the MBA. *International Journal of Management Education, 7*, 41-50.

Duncan, J. (1980). The demonstration of capacity limitation. *Cognitive Psychology, 12,* 75-96.

Ford, N. (1999). Information retrieval and creativity: Towards support for the original thinker. *Journal of Documentation, 55*(5), 528-542.

Garvin, D. A. (2003, September-October). Making the case. *Harvard Magazine*, *106*(1), 56-65.

Garvin, D. A. (2004). Participant-centered learning and the case method: A case study teacher in action. Retrieved July 20, 2012, from the Harvard Business School website: http://hbsp.harvard.edu/multimedia/pcl/pcl_1/1/3.8transcript.html

Gaudine, A., & Thorne, L. (2001). Emotion and ethical decision-making in organizations. *Journal of Business Ethics, 31*, 175-187.

Gentner, D., Loewenstein, J., & Thompson, L. (2003). Learning and transfer: A general role for analogical encoding. *Journal of Educational Psychology, 95*, 393-408.

Greenhalgh, A. M. (2007). Case method teaching as science and art: A metaphoric approach and curricular application. *Journal of Management Education, 31*, 181-188.

Hamilton, R. J. (1999). The role of elaboration within a text processing and text adjunct context. *British Journal of Educational Psychology, 69*, 363-376.

Hammond, K. J. (1990). Case-based planning: A framework for planning from experience. *Cognitive Science, 14*, 385-443.

Hand, B., & Prain, V. (2002). Teachers implementing writing-to-learn strategies in junior secondary science: A case study. *Science Education, 86*, 737-755. doi: 10.1002/sce.10016

Harkrider, L. N., MacDougall, A., Bagdasarov, Z., Johnson, J., F., Thiel, C. E., Mumford, M. D., Connelly, S., & Devenport, L. D. (2012a). Structuring case-based ethics training: How comparing cases and structured prompts influence training effectiveness. *Ethics and Behavior*. Advanced online publication. doi: 10.1080/10508422.2012.728470

Harkrider, L. N., Thiel, C. E., Bagdasarov, Z., Mumford, M. D., Johnson, J. F., Connelly, S., & Devenport, L. D. (2012b). Improving case-based ethics training with codes of conduct and forecasting content. *Ethics and Behavior*, *22*, 258-280.

Herreid, C. F. (1998). What makes a good case? Some basic rules of good storytelling help teachers generate student excitement in the classroom. *Journal of College Science Teaching, 27*(3), 163-165.

Herreid, C. F. (2011). Case study teaching. *New Directions for Teaching and Learning, 128*, 31-40.

Johnson, J. F., Thiel, C. E., Bagdasarov, Z., Connelly, S., Harkrider, L., Devenport, L. D., & Mumford, M. D. (2012). Case-based ethics education: The impact of cause complexity and outcome favorability on ethicality. *Journal of Empirical Research on Human Research Ethics*, *7*(3), 63-77. doi:10.1525/jer.2012.7.3.63

Kim, S., Phillips, W. R., Pinsky, L., Brock, D., Phillips, K., & Keary, J. (2006). A conceptual framework for developing teaching cases: A review and synthesis of the literature across disciplines. *Medical Education, 40*, 867-876.

Kolodner, J. L. (1993). *Case-based reasoning*. San Mateo, CA: Morgan Kaufmann.

Kolodner, J. L., Owensby, J. N., & Guzdial, M. (2004). Case-based learning aids. In D. H. Jonassen (Ed.), *Handbook of research on educational communications and technology* (2nd ed., pp. 839-862). Malwah, NJ: Lawrence Erlbaum Associates, Inc.

Lee, H., & Bae, S. (2008). Issues in Implementing a Structured Problem-Based Learning Strategy in a Volcano Unit: A case study. *International Journal of Science and Mathematics Education, 6*, 655-676.

Levin, J. R. (1988). Elaboration-based learning strategies: Powerful theory = powerful application. *Contemporary Education Psychology, 13*, 191-205.

Liang, N., & Wang, J. (2004). Implicit mental models in teaching cases: An empirical study of popular MBA cases in the United States and China. *Academy of Management Learning & Education, 3*, 397-413.

Loewenstein, J., Thompson, L., & Gentner, D. (2003). Analogical learning in negation teams: Comparing cases promotes learning and transfer. *Academy of Management Learning and Education, 2*, 119-127.

Lonergan, D. C., Scott, G. M., & Mumford, M. D. (2004). Evaluative aspects of creative thought: Effects of idea appraisal and revision standards. *Creativity Research Journal, 16*, 231-246.

MacDougall, A. E., Harkrider, L. N., Bagdasarov, Z., Johnson, J. F., Thiel, C. E., Peacock, J., Mumford, M. D., Devenport, L. D., & Connelly, S. (under review). Examining the effects of incremental case building and forecasting outcomes on case-based ethics instruction. *Ethics and Behavior*.

Meyer, D. E., & Kieras, D. E. (1997). A computational theory of executive cognitive processes and multiple-task performance: Part 1. Basic Mechanisms. *Psychological Review, 104*(1), 3-65.

Monro, A. (2012). Harvard business publishing releases case analysis coach. Retrieved September 9, 2012, from http://www.businesswire.com/news/home/20120412006342/en/Harvard-Business-Publishing Releases-Case-Analysis-Coach

Mumford, A. (2005). The case method – Does learning theory matter? *Development and Learning in Organizations, 19*(4), 17-19.

Mumford, M. D. (2003). Where have we been, where are we going? Taking stock in creativity research. *Creativity Research Journal, 15*, 107-120.

Mumford, M. D., Connelly, S., Brown, R. P., Murphy, S. T., Hill, J. H., Antes, A. L., Waples, E. P., & Devenport, L. D. (2008). Sensemaking approach to ethics training for scientists: Preliminary evidence of training effectiveness. *Ethics and Behavior, 18*, 315-339.

Mumford, M. D., Devenport, L. D., Brown, R. P., Connelly, M. S., Murphy, S. T., Hill, J. H., & Antes, A. L. (2006). Validation of ethical decision-making measures: Evidence for a new set of measures. *Ethics and Behavior, 16*, 319-345.

O'Fallon, M. J., & Butterfield, K. D. (2005). A review of the empirical ethical decision-making literature. *Journal of Business Ethics, 59*, 375-413.

Pask, G. (1976). Styles and strategies of learning. *British Journal of Educational Psychology, 46*, 128-148.

Peacock, H. J., Harkrider, L. N., Bagdasarov, Z., Connelly, S., Johnson, J. F., Thiel, C. E., MacDougall, A. E., Mumford, M. D., Devenport, L. D. (2012). Effects of alternative scenarios and structured outcome evaluation on case-based ethics instruction. *Journal of Science and Engineering Ethics*. Advanced online publication. doi: 10.1007/s11948-012-9402-7

Reder, L. M. (1980). The role of elaboration on the comprehension and retention of prose A critical review. *Review of Educational Research, 50*(1), 5-53.

Reimann, P., & Schult, T. J. (1996). Turning examples into cases: Acquiring knowledge structures for analogical problem solving. *Educational Psychologist, 31*(2), 123-132.

Richardson, B. (1994). Towards a comprehensive view of the case method in management development. *Industrial and Commercial Training, 26*, 3-8.

Rivard, L. P. (1994). A review of writing to learn in science: Implications for practice and research. *Journal of Research in Science Teaching, 31*(9), 969-983.

Schmidt, H. G., Rotgans, J. I., & Yew, E. H. J. (2011). The process of problem-based learning: What works and why. *Medical Education, 45*, 792-806.

Setia, S., Bobby, Z., Ananthanarayanan, P., Radhika, M., Kavitha, M., & Prashanth, T. (2011). Case based learning versus problem based learning: A direct comparison from first year medical students' perspectives. *Webmed Central Medical Education, 2*, 1-14.

Stenmark, C. K., Antes, A. L., Thiel, C. E., Caughron, J. J., Xiaoqian, W., & Mumford, M. D. (2011). Consequence identification in forecasting and ethical decision-making. *Journal of Empirical Research on Human Research Ethics*, *6*, 25-32.

Stenmark, C., Antes, A. L., Wang, X., Caughron, J., Thiel, C. E., & Mumford, M. D. (2010). Strategies in forecasting outcomes in ethical decision-making: Identifying and analyzing the causes of the problem. *Ethics and Behavior, 20,* 110-127.

Stewart, T. L., Myers, A. C., & Culley, M. R. (2010). Enhanced learning and retention through "writing-to-learn" in the psychology classroom. *Teaching of Psychology, 37*, 46-49. doi:10.1080/00986280903425813

Stonham, P. (1994). For and against the case method. *European Management Journal, 13*, 230-232.

Thiel, C. E., Bagdasarov, Z., Harkrider, L., Johnson, J., & Mumford, M. D. (2012). Leader ethical decision-making in organizations: Strategies for sensemaking. *Journal of Business Ethics, 107*, 49-64.

Thiel, C. E., Connelly, S., Harkrider, L., Devenport, L. D., Bagdasarov, Z., Johnson, J. F., & Mumford, M. D. (2011). Case-based knowledge and ethics education: Improving learning and transfer through emotionally rich cases. *Science and Engineering Ethics*. Advanced online publication. doi:10.1007/s11948-011-9318-7

Van Kleef, G. (2009). How emotions regulate social life: The emotions as social information (EASI) model. *Current Directions in Psychological Science, 18*, 184–188.

Walker, C. (2009). Teaching policy theory and its application to practice using long structured case studies: An approach that deeply engages undergraduate students. *International Journal of Teaching and Learning in Higher Education, 20*, 214-225.

Weick, K. (1995). Sensemaking in Organizations. Thousand Oaks, C.A.: Sage Publications.

Willoughby, T., Wood, E., McDermott, C., & McLaren, J. (2000). Enhancing learning through strategy instruction and group interaction: Is active generation of elaborations critical? *Applied Cognitive Psychology, 14*, 19-30.

Xiao, Y., Milgram, P., & Doyle, D. J. (1997). Capturing and modeling planning expertise in anesthesiology: Results of a field study. In C. E. Zsambok, & G. Klein (Eds.), Naturalistic decision making (pp. 197-205). Hillside, NJ: Lawrence Erlbaum Associates, Inc

APPENDIX A

SENSEMAKING STRATEGIES

	Strategy	*Operational Definition*
1	Recognizing your circumstances	Thinking about origins of problem, individuals involved, and relevant principles, goals & values
2	Seeking outside help	Talking with a supervisor, peer, or institutional resource, or learning from others' behaviors in similar situations
3	Questioning your own and others' judgment	Considering problems that people often have with making ethical decisions, remembering that decisions are seldom perfect
4	Dealing with emotions	Assessing and regulating emotional reactions to the situation
5	Anticipating consequences of actions	Thinking about many possible outcomes such as consequences for others, short & long term outcomes based upon possible decision alternatives
6	Analyzing personal motivations	Considering one's own biases, effects of one's values and goals, how to explain/justify one's actions to others, & questioning ability to make ethical decisions
7	Considering the effects of actions on others	Being mindful of others' perceptions, concerns, and the impact of your actions on others, socially and professionally