The Effects of Success-based and Failure-based Case Studies on Veterinary Students' Real-World Problem-solving Skills

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Abstract

Real-world problem-solving skills are critical for veterinary students to succeed in their future career. To better prepare them for real-world problems, many researchers argued that authentic cases experienced by practitioners should be included in the process of instruction to expand students' repertoires of experience through others.

But most of the cases used in instruction are based on best practices. Few of them include any failures, which are inevitable in reality. Although a recent study exploring the efficacy of success-based and failure-based cases on students' argumentation skills showed that failure-based cases promoted students' overall argumentation skills, more empirical studies are needed to further validate the result.

So the study aims to explore how mistakes or failures included in case studies might differ from best practices demonstrated in success-based cases in their impact on students' real-world problem-solving skills.

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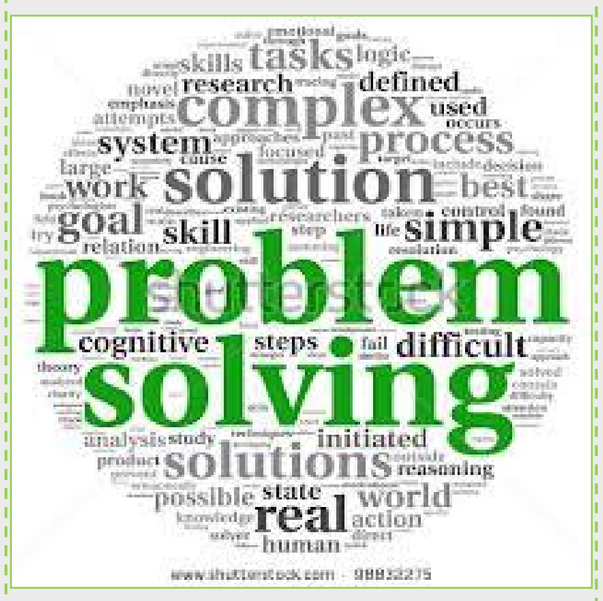
Introduction

Recently, in the field of veterinary education, a shift of focus from content knowledge to competencies is gradually taking place (Dawson, Miller, Goddard & Miller, 2013). Competencies refer to capabilities that veterinary students are expected to have in order to practice veterinary medicine independently and provide healthcare for a variety of animals (AVEA COE, 2013).

However, real-world problem-solving is not easy to teach, especially in formal classroom settings, because most problems covered in classrooms are decontextualized well-structured problems, while problems in real-world contexts are often complex and ill-structured (Tawfik & Jonassen, 2013).



To address the problem, Jonassen (1997) argued that authentic cases experienced by practitioners should be included in instruction to better prepare students for real-world problems, because by observing the problem-solving process carried out by experienced practitioners, students who are in lack of relevant experience may learn how to reason and how to come up with appropriate solutions in similar situations and therefore expand their repertoires of experience through others (Kolodner, 1997).

In the past decade, some researchers found that although more empirical studies are needed to further validate the value of using cases, there are positive results indicating that students benefit from learning through cases in terms of real-world problem-solving skills.

But most of the cases used in instruction are based on best practices. Few of them include any failures, which are inevitable in reality. Although a recent study exploring the efficacy of success-based and failure-based cases on students' argumentation skills showed that failure-based cases promoted students' overall argumentation skills, more empirical studies are needed to further validate the result.

Purpose of Study

The purpose of this study will be to compare the effect of success-based cases with that of failure-based cases on real-world problem-solving skills of junior veterinary students from the University of Georgia's Department of Small Animal Medicine and Surgery.

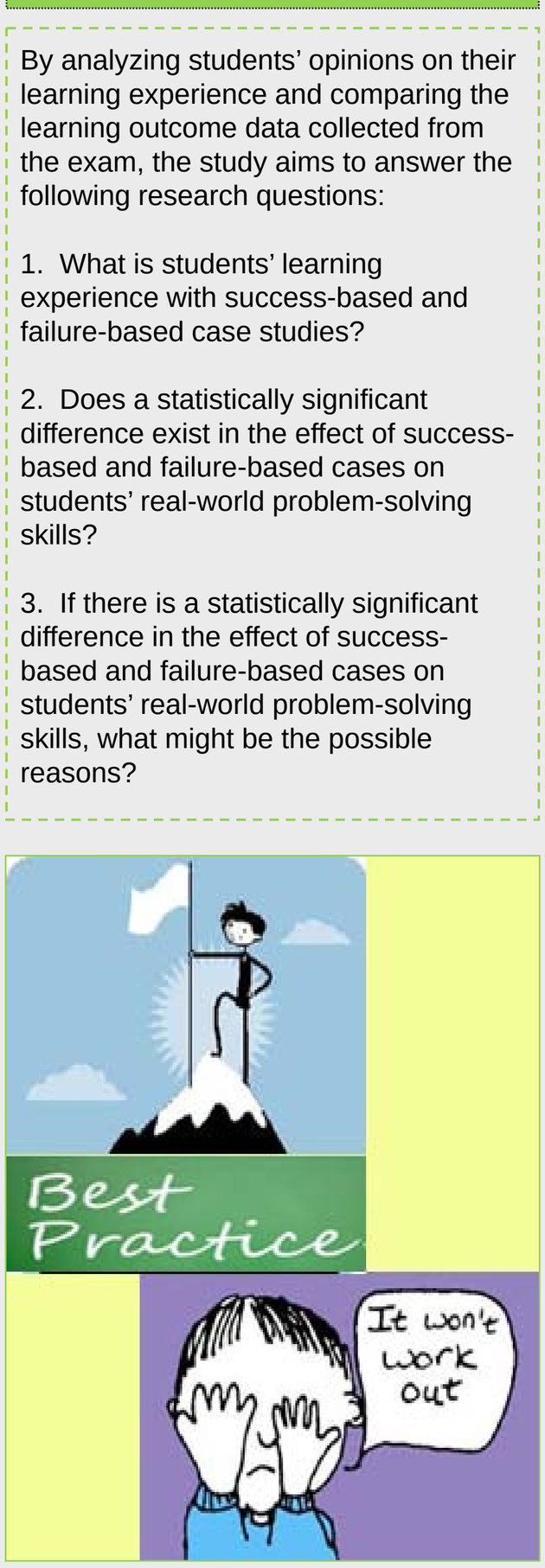
Research Questions

By analyzing students' opinions on their learning experience and comparing the learning outcome data collected from the exam, the study aims to answer the following research questions:

1. What is students' learning experience with success-based and failure-based case studies?

2. Does a statistically significant difference exist in the effect of success-based and failure-based cases on students' real-world problem-solving skills?

3. If there is a statistically significant difference in the effect of success-based and failure-based cases on students' real-world problem-solving skills, what might be the possible reasons?

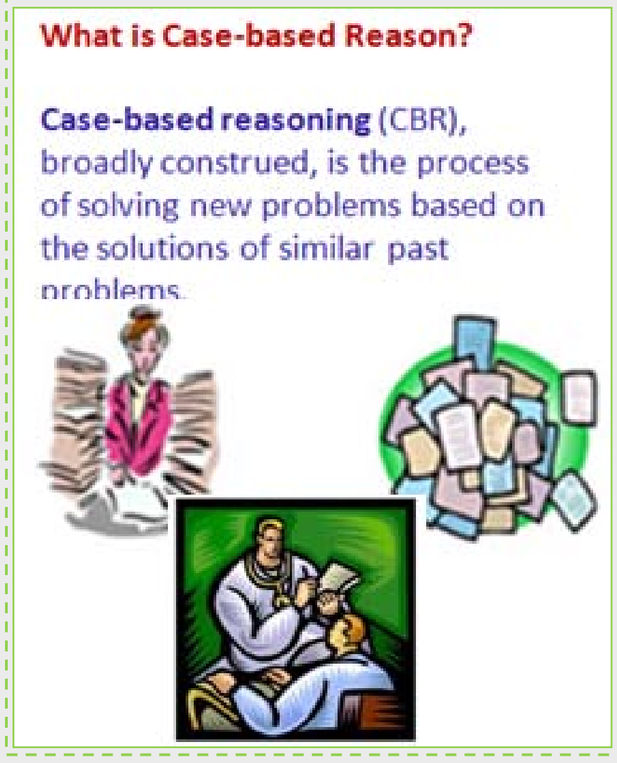


Theory

There are two main theories that guide this study: case-based reasoning (CBR) and the theory of failure-driven memory.

CBR argues that by making useful analogical inferences based on past experience (Aamodt & Plaza, 1996), people can identify problems that they need to pay special attention to and accordingly propose appropriate solutions based on the new context (Kolodner, 1997).

However, as novices, students lack relevant past experiences. To address the problem, CBR can be applied through a case library (Jonassen, 1997; Hernandez-Serrano & Jonassen, 2003) to help students reason beyond what they could do otherwise based on cases indexed into their own memory (Kolodner, 1997).



While it's easy to assume that cases representing best practices carried out by experienced practitioners are the most effective to help students construct mental models for problem solving (Tawfik & Jonassen, 2013), Schank's (1999) theory of failure-driven memory suggests that failures provide better chances to learn. According to Schank (1999), learning is all about memory modification triggered by failed prediction and any learning situation depends upon expectation failure.

Importance of Study

1. Understanding the different effects of success-based and failure-based cases can help instructional designers explore more effective instructional strategies to enhance students' problem-solving skills.
2. Very limited empirical studies exist in this field.
3. This study might contribute to literature related to learning from failures in traditional classroom contexts.