## Introduction and Problem Background

In today's rapidly evolving world, the importance of critical thinking skills in science education cannot be overstated. Critical thinking is the ability to analyze, evaluate, and synthesize information objectively to solve problems and make informed decisions. This skill is essential for success in various fields, including science and technology, where it is necessary to adapt to ever-changing knowledge and advancements.

Despite the importance of critical thinking in science education, teachers often face significant challenges and barriers in promoting and developing these skills among students. The purpose of this dissertation is to examine the challenges and barriers faced by teachers in promoting critical thinking skills in science education using a case study approach.

## Literature Review

In this section, we will review the existing literature on critical thinking in science education, the challenges faced by teachers, and the barriers that impede the development of these skills.

### Critical Thinking in Science Education

1. \*The importance of critical thinking in science education:\* Numerous studies have highlighted the significance of critical thinking skills in science education. Critical thinking allows students to evaluate scientific evidence, understand the scientific process, and engage in scientific inquiry (Abrami et al., 2008; Osborne, 2013).

### Challenges Faced by Teachers

2. \*Lack of professional development and support:\* Many teachers report a lack of professional development and support in teaching critical thinking skills, which can affect their ability to promote these skills effectively (Innabi & El Sheikh, 2006).

3. \*Curriculum constraints:\* Teachers often face curriculum constraints that limit their ability to incorporate critical thinking activities into science lessons (Facione, 2006).

### Barriers to Developing Critical Thinking Skills

4. \*Students' prior knowledge and misconceptions:\* Research has shown that students' prior knowledge and misconceptions can hinder the development of critical thinking skills in science education (Hamza & Wickman, 2009).

## Research Methodology

This study employs a qualitative case study approach to explore the challenges and barriers faced by teachers in promoting critical thinking skills in science education. The choice of a case study approach allows for an in-depth examination of the specific context, which is essential in understanding the factors contributing to the problem.

### Participants

The participants in this study include science teachers from three different schools with varying levels of experience in teaching.

### Data Collection

Data will be collected through semi-structured interviews with participating teachers and classroom observations. The interviews will focus on teachers' experiences, challenges, and barriers in promoting critical thinking skills in science education.

## Data Collection and Findings

This section will present the findings from the interviews and classroom observations, highlighting the challenges and barriers faced by teachers in promoting critical thinking skills in science education.

### Challenges Faced by Teachers

#### Lack of Professional Development and Support

Teachers reported a lack of professional development and support in teaching critical thinking skills, which hindered their ability to promote these skills effectively.

#### Curriculum Constraints

Curriculum constraints limited teachers' ability to incorporate critical thinking activities into science lessons, making it challenging to promote these skills.

### Barriers to Developing Critical Thinking Skills

#### Students' Prior Knowledge and Misconceptions

Students' prior knowledge and misconceptions emerged as significant barriers to the development of critical thinking skills in science education.

## Conclusion and Recommendations

This study has highlighted the challenges and barriers faced by teachers in promoting critical thinking skills in science education. Based on the findings, the following recommendations are proposed:

1. Provide professional development opportunities and support for teachers to enhance their ability to promote critical thinking skills in science education.

2. Revise curriculum guidelines to allow for greater flexibility in incorporating critical thinking activities into science lessons.

3. Implement strategies to address students' prior knowledge and misconceptions, facilitating the development of critical thinking skills.

## References

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## Appendix

The appendix will contain interview transcripts, classroom observation notes, and other relevant data collected during the study.