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**Faculty Perceptions of the Use of Virtual  
Learning Environments in Introductory Biology  
Courses**

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PRESENTATION**

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## Author

**Whitley Webb, PhD**

Graduate

Riley College of Education and Leadership

[whitley13@rocketmail.com](mailto:whitley13@rocketmail.com)

LinkedIn: <https://www.linkedin.com/in/dr-whitley-webb-b04039156/>

## Supervisory Committee

**Debra Tyrrell**, Committee Chairperson

**Christopher Rasmussen**, Committee Member

**Sydney Parent**, URR Member

## Abstract

Blended learning (BL) and virtual learning environments (VLEs) are innovative approaches that many educators are using to promote student success and learning in introductory biology courses. However, research does not provide insight into whether specific VLEs such as Mastering Biology (MB), are useful or effective in increasing student success. The purpose of this basic qualitative research study was to explore the experiences and perceptions of 10 higher education introductory biology instructors on using BL and VLEs to promote student learning. Results indicated that BL and VLEs are useful or effective tools that help to promote student success and learning.

*Doctoral Capstone*

## Problem

With continued low student success rates, which are as low as 40% in some introductory biology courses, many higher education institutions are continually looking for ways to increase **student completion rates** and **promote student learning** (Beard, 2017).

## Purpose

The purpose of this **basic qualitative research study** was to explore experiences and perceptions of higher education introductory biology instructors regarding the use of **blended learning (BL)** and a **virtual learning environment (VLE), Mastering Biology (MB)**, to promote student learning.

## Significance

This study contributed to the identified gap in research, exploring ways for educators to help increase student success in introductory biology courses by providing **insight** into **instructors' perceptions and experiences** regarding the use of BL and MB in introductory biology courses.

Both instructors and administrators can use the information gained from this to help inform biology educators about the **potential value** of using MB or other VLEs as tools to **promote student learning**.

## Theory or Framework

The **connectivism theory** provided important information about how technology can be used in learning environments (Siemens, 2005; Downes, 2005a) .

Using the **connectivism learning theory** educators can examine the **networks** of knowledge between learners and technology-facilitated sources.

**Connections** that form between learners and external information in databases or other repositories that enable new learning to occur (Siemens, 2005).

## Relevant Scholarship

Higher education introductory biology courses have consistently disappointing student success rates. Educators continue to look for ways to ways not only to increase student success in introductory biology courses but also to promote student learning (Batz et al., 2015; Fuller, 2017).

An approach currently being used in these courses includes using BL and VLEs in the curriculum (Boulton et al., 2018). Many instructors have begun using MB to help promote student learning in introductory biology courses.

Teacher perceptions and experiences regarding the gap in research and the use of BL and VLEs in introductory biology courses have not yet been studied in detail, in particular, teachers' experiences using specific VLEs (Herodotou et al., 2018).

## Research Questions

**RQ1:** How do biology instructors use MB to boost student success in introductory biology courses?

**RQ2:** What are the perceptions of biology instructors regarding the efficiency and usefulness of BL and MB to promote student learning?

**RQ3:** What are biology instructors' recommendations on how MB and other VLEs can be used more effectively in introductory biology courses?

## Participants

A snowball or chain sampling approach was used to select participants.

The final sample size was 10 higher education introductory biology instructors who taught a BL undergraduate introductory biology course and had at least 1 year of experience using MB.

## Procedures

An interview guide, which I created, was used to guide the in-depth interviews. I developed the interview questions, including the open and closing statements, using the literature review and theoretical framework.

The 10 interviews were scheduled for 45 minutes to 1 hour over a 3-week period.

## Analysis

The interview transcripts were analyzed to identify themes in the responses. I used an emergent coding approach.

# Findings

The four themes for each research question can be found in the below table:

	RQ1	RQ2	RQ3
Theme 1:	Adapting to student needs	Student enhancement	Communication
Theme 2:	Supplemental materials	Overwhelming	Conciseness
Theme 3:	Interactive activities	Adaptable	Frustration
Theme 4	Student involvement	Student success	Outside Resources

## Interpretation

The results suggest that when educators use BL and MB in higher education introductory biology courses, most found that MB and other VLEs help **increase** student success and **promote** student learning.

Instructors use VLEs to give students access to **additional resources** to **supplement** lecture content and **adapt** resources to student needs.

## Limitations

### Potential Limitations include:

- small sample size
- the social desirability bias as educators may desire to be perceived positively; hence, they may not answer interview questions honestly.
- inclusion criteria of only interviewing higher education instructors that have used BL and MB for at least one year.

# Recommendations

## For higher education

- inform other biology educators about the potential value of using MB or other VLEs
- the use of BL and VLEs in other disciplines.

## For future research includes:

- specific VLEs used in multiple disciplines.
- students' experiences with and perceptions of BL and VLE use in courses.
- exploring the perceptions and experiences of higher education instructors' use of BL and VLEs in other disciplines.
- benefits and challenges of using VLEs in higher education courses.
- student success/outcomes in BL courses versus traditional F2F courses.

# Social Change Implications

More knowledge about BL and VLEs and the implications of using these innovations could lead to positive social change as educators could promote student learning and success.



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