

©Michael Lee Schad 2019
All Rights Reserved

A Teacher's Adoption of Maker-Centered Learning: A Phenomenological Case Study

A dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in Education at Virginia Commonwealth University.

by

Michael Lee Schad
M.Ed., University of Richmond, 2015
M.F.A., Hollins University, 2006
B.A., University of Mary Washington, 2004

Director: W. Monty Jones, Ph.D.,
Assistant Professor, Department of Teaching & Learning
VCU School of Education

Virginia Commonwealth University
Richmond, Virginia
December, 2019

Acknowledgments

I would like to acknowledge Jesus, as I would not have begun the journey into the realm of education without divine intervention. Next, my wife, Amy, thank you. I wanted to give up so many times, but you would not allow me to; moreover, you loved me well through the process. Brionna, Bryan, Kim, and Virginia thank you for your support, laughter and conversation throughout the process, I couldn't have asked for a better team. Friends, thank you for your love and support, and for listening to me complain and telling me I could do it. Bell family your support was crucial and I hope to get more of that cake. Monty, without your encouragement and guidance I would have been lost (metaphorically and physically); I will miss our regular conversations on food, tech, and life. Bill, thank you for taking me into phenomenology land; I may never leave. Also, the conversations and insights were crucial for finishing this paper. Elizabeth, your knowledge of science was spot on and our upbeat conversations often eased my anxiety ridden mind about ever finishing. Shaunna, I really appreciated your insights and general levity towards the process of dissertating. Ross, thank you for reading and offering feedback during the process; it was greatly appreciated. In general, I feel as though I had the best committee and was humbled by your intelligence and care for this paper. Thank you each. Mom and Dad thanks for all the years of education, love and support. Jake and Dymphna, you are great, and I am so thankful for you. Grandma, you are a blessing, thank you for your constant encouragement. Alex and Spencer, you are the best nephews I could have asked for; I am excited for you to meet your new cousin. We do not know his name yet, but I am sure he will have a great one.

Table of Contents

Acknowledgement.....	iii
List of Tables	vi
List of Figures	vii
Abstract	viii
Chapter 1: An Introduction.....	1
Prologue: Philosophy of Making.....	1
Context of the Study.....	5
Research Background.....	6
Purpose of the Study.....	7
Theoretical Framework.....	8
Conceptual Framework.....	15
Research Questions.....	16
Methods.....	17
Summary.....	18
Definition of Terms.....	18
References.....	20
Chapter 2: Review of Literature.....	23
Methods.....	23
Results.....	28
Gaps in the Literature.....	47
References.....	51

Chapter 3: Methodology.....	55
Research Questions.....	56
Study Design.....	56
Procedures.....	59
Limitations.....	68
Chapter 4: Findings and Givings.....	69
Maker-Centered Teacher Professional Development.....	80
Gentle Exactness.....	83
Janice’s Movement.....	96
Disembodied Hand.....	101
Retirement.....	105
Conclusion.....	108
Discussion.....	109
Lifeworld Experience.....	110
Conclusion.....	117
References.....	122
Appendices	124
Maker Centered-Learning Framework.....	124
Agency by Design Framework	125
Contact Summary Form.....	126
Preliminary Interview Questions.....	127
Reflection Questions.....	130
Signage.....	131

Attitude Signage.....133
Classroom Setup.....134

List of Tables

Table 1: Agency by Design Definitions.....10
Table 2: Operationalization of Terms.....11
Table 3: Process of Review.....24
Table 4: Articles Reviewed.....26

List of Figures

Figure 1: The Framework for Maker-Centered Learning10

Abstract

A TEACHER'S ADOPTION OF MAKER-CENTERED LEARNING: A
PHENOMENOLOGICAL CASE STUDY

Michael Lee Schad

M.Ed., University of Richmond, 2015

M.F.A., Hollins University, 2006

B.A., University of Mary Washington, 2004

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Education at Virginia Commonwealth University.

Virginia Commonwealth University 2019

Chair: W. Monty Jones, Ph.D.,

Assistant Professor, Department of Teaching & Learning

VCU School of Education

The maker movement is a social movement which espouses the importance of artifact creation through physical and digital tools. As the maker movement moves into educational spaces, researchers and educators are exploring ways to integrate it alongside current classroom practices. A prevalent framework for maker integration is the maker-centered learning framework, which was used as part of the conceptual framework. Currently, more research is needed which justifies and analyzes maker-centered learning in an educational environment. This study aimed to use phenomenological methods to capture the lived experience of chemistry teacher as she integrated the maker-centered learning framework into her chemistry classroom.