PERSONALIZED LEARNING: A META-ANALYSIS

A Thesis

Presented to

the Faculty of

The Southern Baptist Theological Seminary

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

David Alex Ogle

May 2021

APPROVAL SHEET

PERSONALIZED LEARNING: A META-ANALYSIS

David Alex Ogle

Read and Approved by:

_____
Anthony W. Foster (Chair)

_____
Jeffrey M. Horner

Date_____

For the glory of God

And for my family, who is my secondary motivation for all things

TABLE OF CONTENTS

Page

LIST OF TABLES AND FIGURES ix

PREFACE x

Chapter

1. INTRODUCTION 1

Introduction to the Research Problem 1

The Two-Sigma Problem 2

Definitions and Descriptions of Personalized Learning 4

Disaccord in Definitions ofPersonalized Learning 4

Personalized Learning Definedand Described 6

Origins of Personalized Learning 9

Presentation of the Research Problem 14

Current Status of the Research Problem 15

Research Purpose 16

Research Questions 16

Delimitations of the Proposed Research 16

Definition of Research Population 17

Description of the Research Sampleand Sampling Technique 17

Delimitations of the Samples 17

Terminology 18

Overview of Methodological Design 18

Instrumentation 19

Chapter Page

2. PRECEDENT LITERATURE 20

Biblical-Theological Foundations for Personalized Learning in Christian Education 20

Respect for the Unique Creature 22

Christian Formation 24

The Array of Research on Personalized Learning 26

Implementations of Personalized Learning 27

Elements of Personalized Learning: Student Plans and Student-Directed Pacing 29

The Need for Models and Benefitsof Personalized Learning 31

Benefits of Personalized Learning: Teacher and Student Relations 33

RAND's Personalized Learning Research 34

Further Literature Concerning Personalized Education 37

Concerns Surrounding Personalized Learning 43

Conclusion 47

3. METHODOLOGICAL DESIGN 49

Meta-Analysis 51

Purpose Statement 53

Research Questions 53

Research Design Overview 53

Research Problem 54

Delimitations 55

Research Method and Instrumentation 56

Search Queries in ProQuest 56

Processing of Data 56

Coding Criteria 57

Types of Queries Used 58

Chapter Page

Ethics Committee Process....58
Research Procedures....58
4. ANALYSIS OF FINDINGS....60
Research Procedures....60
Collection of Qualifying Dissertations....61
Coding Procedures....61
Research Results....63
Research Question 1: Commonalities inTerminology of Personalized Learning....63
Commonalities Identified in Terminology Associated with the Definitions of Personalized Learning....64
Terminology Emerged in the Coding Process of Benefits and Elements of Personalized Learning....66
Matrix Coding Query....70
Research Question 2: Emergent Benefits andElements of Personalized Learning....72
Benefits of Personalized Learning....73
Elements of Personalized Learning....75
Research Question 3: Personalized Learningand Christian Education....83
Common Terms and Christian Education....84
Emergent Benefit and Elementsand Christian Education....86
Concluding Summary....87
5. CONCLUSION....90
Purpose Statement....90
Research Questions....90
Summary of Analysis....91
Commonalities in Terminology....91
Emergent Elements....92

Page

Emergent Benefits 94

Benefits and Elements withthe Lowest Prevalence 95

Implications of Research 98

Common Terminology 98

Emergent Benefits and Elements 99

Applications of Research 99

An Application to Bloom'sTwo-Sigma Problem 101

Technology and Personalized Learning 104

Limitations 105

Limitations on the Scope and Population 106

The Matrix Coding Queryand Co-Occurrences 106

Statistical Analysis 107

Strengths and Weaknesses 108

Strengths of This Research 108

Weaknesses of This Research 111

Recommendations for Future Studies 112

Appendix

1. BIBLIOGRAPHY OF DISSERTATIONSINCLUDED IN THE POPULATION 115
2. LIST OF CODING CATEGORIES BY FREQUENCY ORDER WITH SUBCATEGORIES 117
3. LIST OF BENEFITS BY FREQUENCY ORDER WITH SUBCATEGORIES 123
4. DEFINITIONS CATEGORY: WORDFREQUENCY QUERY RESULTS 125
5. WORD CLOUD VISUALIZATION 140
6. RUBRIC FOR IDENTIFYING ELEMENTS IN A MODEL OF PERSONALIZED LEARNING 141

Appendix Page

7. A RUBRIC FOR IDENTIFYING BENEFITS OF PERSONALIZED LEARNING.....152

BIBLIOGRAPHY..... 153

LIST OF TABLES AND FIGURES

Table Page

1. Words most frequently used in identified definition of personalized learning 65

2. Alphabetical list of common terminology surrounding the benefits of personalized learning 68

3. Terminology concerning elements of personalized learning 69

4. Top benefits of personalized learning 73

5. Top elements of personalized learning 76

Figure

1. Visualization of matrix coding query results 72

A1. Word cloud visualization of most commonly used words in definitions of personalized learning 140

PREFACE

My work would not be here but for the enormous efforts put forth by several people. Jesus Christ, my King and Savior, is the first who comes to mind. May his purposes for drawing me to this study be fulfilled in their entirety. Second, my wife, Katie Lynn Ogle, has worked harder than I have, maintaining the family, reading my work, and generally helping me during this endeavor. Third, my cohort mates have given me as much kindness and thought provocation as any in my life. Iron sharpens iron. Lastly, Dr. Anthony Foster, has graciously put up with my neediness and has kindly guided me through this process. I am grateful to God for you all; you are his grace in my life.

My prayer is that this work will further educational efforts for the next generation. It is my task to help train them to carry the gospel and offer hope to the lost.

David

Knoxville, Tennessee

December 2020

CHAPTER 1

INTRODUCTION

> All learning is personal. . . . All learning engages what we already know in pursuit of what we don't know yet. Learning forces us to look closely at information that may not support our initial beliefs. Learning forces us to entertain several choices and make a stand. . . . Learning makes us reorganize information into patterns that yield personal meaning. . . . Learning follows personal engagement.[1]

A recent search on the ProQuest Dissertation and Thesis database for the terms *personalized learning* resulted in 104,443 related hits. Personalized learning is a popular topic of research. However, there is a clear decohesion among developers. John-Patrick G. Clark says, "No single reliable model of personalized learning exists, though the components have been researched thoroughly."[2] The lack of cohesion of personalized learning's terminology, elements, and benefits among the research makes progression in this field tedious. This study addresses personalized learning and the problem connected to the inconsistencies of research on the topic.

Introduction to the Research Problem

Public education administration considers personalized learning to be a solution to low student performance[3]—and for good reason. Personalized learning is implemented at some of the top performing schools in the world.[4] Even the current *off the*

---

[1] John Clarke, "Personalized Learning and Personalized Teaching," in *Personalized Learning: Preparing High School Students to Create Their Futures*, ed. Joseph DiMartino, John Clarke, and Denise Wolk (Lanham, MD: Scarecrow Education Press, 2003), 71.

[2] John-Patrick G. Clark, "Engagement's Mediation of the Relationship between Personalized Learning and Achievement" (EdD diss., Western Kentucky University, 2017), 75.

[3] National Association of Secondary School Principals, *Breaking Ranks II: Strategies for Leading High School Reform* (n.p.: National Association of Secondary School Principals, 2004), 6.

[4] See, e.g., Jesús Paz-Albo, "Is Personalized Learning the Future of School?," *Childhood Education* 93, no. 4 (July–August 2017): 295–99.

shelf books available for teachers claim personalized learning to be a better path to "attain current learning outcomes" and "to grow children."[5] Yet, there is conflicting information suggesting competing benefits of implementation, what elements should be included in a model of personalized learning, and no agreed upon definition of personalized learning. For example, one researcher found that "personalized learning did not show a significant relationship to school-level achievement, which contradicts findings in the literature that personalized learning has a positive correlation with achievement."[6] With conflicting perspectives on the topic, personalized learning's application in educational settings is hindered. However, there are great opportunities for personalized learning, if defined and re-ordered to offer possible solutions to famous problems—like the Two-Sigma Problem, for example.

The Two-Sigma Problem

Personalized learning has the potential to further solutions to the two-sigma problem that Benjamin Bloom presented in 1984. In an attempt to compare conventional master learning and tutoring approaches to education, Bloom documented a key finding. His report on recent graduate research regarding successful classroom settings suggested that tutoring provided a much more conducive learning environment for students.[7] Bloom describes a comparison of three grouping methods for students: conventional class, mastery learning class, and a tutoring class. The conventional class, as the name suggests, consisted of students taught in a normal classroom situation.[8] The mastery learning class

---

[5] Allison Zmuda, Diane Ullman, and Greg Curtis, *Learning Personalized: The Evolution of the Contemporary Classroom* (San Francisco: Jossey-Bass, 2015), 7.

[6] Clark, "Personalized Learning and Achievement," 74.

[7] Benjamin S. Bloom, "The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring," *Educational Researcher* 13, no. 6 (July 1984): 4.

[8] A normal classroom situation, in this instance, refers to what is commonly seen in an average school: a teacher presenting information to a group of students. The methods are often lecture or interactive presentation followed by reinforcement activities done in a group setting.

was different in that procedures for pacing and reteaching were based on the student's ability to meet 80 percent passing on formative assessments. The tutoring class was taught in a maximum of 1:3 teacher-to-student ratio. The results showed tutoring to be the most successful learning environment.

Researchers used the same teaching material and final tests as a control in these experiments. The test scores of the conventional class were used as the standard. When the conventional class was compared to the mastery learning class, the mastery learning students achieved one sigma, or standard deviation, above the average the conventionally taught class. When the conventional class was compared to the tutoring class, the tutoring students demonstrated a two-sigma increase in the standard deviation. This is the two-sigma problem to which Bloom is suggesting solutions.

Personalized learning offers a format for evaluation similar to Bloom's tutoring scenario. The most effective aspects of tutoring that Bloom noted were the tutoring setting, periodical formative tests, and individualized feedback procedures.[9] Personalized learning could be tailored to include these parts and, therefore, present a scalable model. In fact, Allison Zmuda, Diane Ullman, and Greg Curtis suggest personalized feedback that is regular, student friendly, and action oriented.[10] The overlap suggests that personalized learning could be a viable option to answer the Bloom's two sigma problem.

The concept of tutoring similarly exists in some personalized learning models. Odd Eiken describes a school in Sweden where teachers have implemented individualized goal-oriented elements of personalized learning for students. Their roles are multifaceted. Each teacher knows the goals of the students, and their goal attainment

[9] Bloom, "The 2 Sigma Problem," 4.

[10] Zmuda, Ullman, and Curtis, *Learning Personalized*, 68.

is "continuously monitored and assessed."[11] Bloom's tutoring environment also contained goals and attainment with reteaching procedures. Personalized learning has the potential to mimic the successful two-sigma scenario in Bloom's research by building elements of tutoring through the inclusion of student goal monitoring and assessment.

Definitions and Descriptions of Personalized Learning

One of the challenges facing researchers, teachers, and administrators interested in personalized learning is the varying definitions and models presented as personalized learning. In this section, I survey various definitions of personalized learning, present my definition of personalized learning, explain my framework for understanding personalized learning as elements in a model, and offer some clarifications regarding this research. After a definition is presented, I offer information about the origins of personalized learning.

Disaccord in Definitions of Personalized Learning

Personalized learning has many definitions. They often vary from author to author. One author defines learning as personalized if there is achievement recorded for individual students based on a student's individual information.[12] Other authors present a definition connected entirely with a specific recorded personalized learning model.[13] And in another place, personalized learning is tied with student individuality.[14]

---

[11] Odd Eiken, "The Kunskapsskolan ('the Knowledge School'): A Personalised Approach to Education," *CELE Exchange* 2011, no. 1 (2011): 2.

[12] Elizabeth Brott Beese, "How Do They Do It? Describing Nontraditional Designs for Creating and Carrying Out Personalized Plans for Learning in Three High Schools" (PhD diss., Purdue University, 2018), 7.

[13] Michael A. Sereno, "The Impact of a Personalized Learning Framework on Student Achievement" (EdD diss., Edgewood College, 2018), 12–13.

[14] Clark, "Personalized Learning and Achievement," 7.

Elizabeth Beese provides a definition related to the designs of personalized learning. She distinguishes personalized learning based on a 1:1 goal-to-achievement ratio. She says,

> I will call designs "personalizing" as long as they meet the criteria that they output one result per one student based at least in part on information about that student—whether they use technology or not; whether students have ownership over the process or not; and whether students are ultimately assigned to receive their personalized instruction individually or in sorted groups.[15]

Beese's definition includes many elements considered as personalized learning, such as one-to-one assessment with goal alignment or a focus on a singular student. Beese's definition decidedly refuses to include aspects of student ownership or individual instruction. Her definition leaves readers with a strong understanding of only a part of personalized learning. It also leaves a void in understanding the concept as a whole. Other definitions offer alternative perspectives.

One author builds a definition entirely from a pre-existent model of personalized learning. Michael A. Sereno says,

> In this study, personalized learning is defined using a model developed by the Institute for Personalized Learning at the Wisconsin Cooperative Educational Services Agency 1. This model [is] referred to as the Honeycomb model. . . . The model includes three core practices, learning and teaching practices, and various roles, responsibilities, structures, and policies.[16]

The model presented in Sereno's work is multifaceted in its inclusion of the following core practices: learner profiles, customized learning paths, and proficiency based progress.[17] It also offers an understanding of the structures and policies that need to be implemented along with core principles.[18] There is a clear difference in approach to personalized learning between Beese and Sereno. Beese suggests that student goals and

---

[15] Beese, "How Do They Do It?," 6–7.

[16] Sereno, "Impact of a Personalized Learning Framework," 12.

[17] Sereno, "Impact of a Personalized Learning Framework," 13.

[18] Sereno, "Impact of a Personalized Learning Framework," 13.

knowledge are most distinguishable in a design of personalized learning, while Sereno chooses to use a pre-existent model as a definition of personalized learning.

Yet another author offers a distinctive view on personalized learning. John-Patrick Clark says, "The defining feature of personalized learning is designing instruction for students as individuals."[19] Clark suggests that individuality in personalized learning could be the implementation of student information or choice in activities and pacing of lessons.[20] While this definition shows a similar focus on individual student needs, the variation disallows those seeking to implement personalized learning clear access to the information.

The definitions above demonstrate the discord seen in the research on personalized learning. Each definition focuses on different aspects, or elements, of personalized learning. For example, Beese's definition considers a ratio that could be manufactured outside of a model of personalized learning, while Clark's definition could align with Sereno's through the personalized learning element of learner profiles; however, Clark's and Sereno's approaches differ in the models they utilize. These definitions could leave users with an incomplete puzzle.

Personalized Learning Defined and Described

In the present research endeavor, I understand personalized learning as the phenomenon in education that develops an approach to teaching from the consideration of a student's uniqueness as seen in learning styles, interests, and motivations. Personalized learning is the attempt to tailor-fit skills and knowledge acquisition to the uniqueness of a student. There are two definitions that this research draws upon to define personalized learning.

---

[19] Clark, "Personalized Learning and Achievement," 7.

[20] Clark, "Personalized Learning and Achievement," 6.

The first definition of personalized learning focuses on the individual student and creating a process that is *tailored* to them. As John F. Pane et al. say,

> [Prioritizing] a clear understanding of the needs and goals of each individual student and the tailoring of instruction to address those needs and goals. These needs and goals, and progress toward meeting them, are highly visible and easily accessible to teachers as well as students and their families, are frequently discussed among these parties, and are updated accordingly.[21]

The tailoring of a program seems to best fit the perspective this research maintains in its definition.

The second definition of influence presents the idea of the *uniqueness* found in students. Bernice J. Wolfson says that personalized learning should consist of the ways in which teachers continue "to develop the uniqueness of each child."[22] While I am not propagating a Christian perspective on education, the word *uniqueness*—from a Christian perspective—does hint at the idea of a Creator's individual design of each human.

In this research project, my definition rejects the notion of personalized learning as a reference to technological advancements but includes the usage of technology as a means to support personalized learning experience in the educational setting. I also reject a capitalistic definition of the word *personalized*, which is concerned with adding the ability to change the appearance of a commodity to the individual preference of a consumer as a marketing scheme.[23] That capitalistic side of personalization is more readily understood as *customization*.[24]

---

[21] John F. Pane et al., *Informing Progress: Insights on Personalized Learning Implementation and Effects* (Santa Monica, CA: RAND, 2017), 6, https://www.rand.org/pubs/research_reports/RR2042.html.

[22] Bernice J. Wolfson, "The Educational Scene," *Elementary English* 40 (April 1963): 457.

[23] An example of this kind of personalization, or customization, is seen in the availability of purchasing sodas with names on the container.

[24] Matthew Paul Thomas, "Personalized Learning: A Case Study of Supporting Literature Applied to Practice and Implementation in a High School" (EdD diss., University of Pittsburgh, 2018), 3.

It is also a consideration of this research endeavor to conceptualize the current phenomenon of personalized learning into two distinguishable categories: elements and models. The distinction is carried throughout this research as a means of offering clarity in personalized learning. This research considers the inclusion or rejection of various elements of personalized learning in order to develop numerous models of personalized learning. The distinction between elements and models is built upon the usage of similar terms in other research.

The models approach to understanding personalized learning is related to Andrea Yeager Neuzil's approach to understanding subtleties of personalized learning. Neuzil offers insight into three models of personalized learning: problem-based learning, New York's School of One's usage of learning algorithms, and the learning philosophy of the Institute for Personalized Learning—a division of Cooperative Educational Service Agency #1 (or CESA #1).[25] Neuzil's section titled "Personalized Learning Models" inspired the usage in this research.

Next, the understanding of various elements as parts of the models is connected to the research done by John-Patrick Clark. Clark describes several parts of personalized learning in various educational settings as *aspects*. Clark's usage of *aspects* when considering personalized learning prompted my use of *elements* in this research project. An example of this usage is found when Clark says, "The Learning Process details the components mostly closely related to the instructional aspects of personalized learning (i.e., mastery-oriented, autonomy, assessment)."[26]

A benefit of considering personalized learning as two parts is clarity for the user. For example, Beese's definition ("output one result per one student based at least in

[25] Andrea Yeager Neuzil, "Equitable Student Engagement: A Correlation between Personalized Learning, Student Engagement, and Poverty Level" (EdD diss., University of Nebraska Omaha, 2016), 18–19.

[26] Clark, "Personalized Learning and Achievement," 61.

part on information about that student"[27]) suggests that a design is personalized if it includes a ratio of student goal and student information. If readers were to consider Beese's perspective as one defining element in a model of personalized learning that could be removed or altered, then the usability of her perspective increases. Beese's research could then be considered alongside other elements of personalized learning. The ability to combine elements to create models could be beneficial to anyone seeking to implement personalized learning. Now that a definition of personalized learning has been presented, in the next section I will present information about the origins of personalized learning.

Origins of Personalized Learning

Ces'Ari Racine Garcia-Delmuro points to the lack of clarity in the origins of personalized learning as a possible reason for the lack of a consensus concerning a definition of personalized learning.[28] Personalized learning has unclear connections to several approaches to education and developmental theories. On the one hand, there is a root extending from the mastery learning research suggested by Bloom and the Personalized System of Instruction (PSI) developed by Fred Keller.[29] On the other hand, some researchers follow a more traditional route of modernized logical development that relates to Jean-Jacques Rousseau's *Emile, or On Education*.[30] I will briefly explore both routes of the origin of personalized learning, discussing, first, Keller's PSI and its

[27] Beese, "How Do They Do It?," 6–7.

[28] Ces'Ari Racine Garcia-Delmuro, "Teacher Experience with Personalized Learning: Training, Program Elements, and Teacher Role at Two Low SES Schools" (EdD diss., University of California, Los Angeles, 2019), 24.

[29] Fred S. Keller and J. Gilmour Sherman, *The Keller Plan Handbook* (Menlo Park, CA: W. A. Benjamin, 1974).

[30] Jean-Jacques Rousseau, *Emile, or On Education* (New York: Basic Books, 1979).

connections to mastery learning and, second, Rousseau's *Emile* and its connections to personalized learning.

Connections to mastery learning. In his dissertation published in 2017, Clark notes the development of personalized learning from J. B. Carroll's famous work *A Model of School Learning*.[31] As Clark points out, Carroll's model suggests the inclusion of "individual aptitude, comprehension of instruction, perseverance, time allowed for learning, and quality of instruction."[32] Carroll's concern is not mainly about the time lapsed in the process of learning but that the student has learned.[33] Carroll's unique model charted a course directly to Bloom's work on mastery learning.[34] Both authors, Carroll and Bloom, seek to include elements of student pacing intent to serve the specific needs of students. These approaches were later developed into a system for higher education courses.

Keller implemented a type of personalized learning at the college level in his Personalized System of Instruction. Keller describes a PSI course as one in which a student "may move, from start to finish, at [his or her] own pace"[35] and in which "every student should come out with and *A*."[36] Keller's high expectations are due in part to the mastery design of the assignments. Keller says that course work is to be studied "until it is fully mastered,"[37] the demonstration of which does not necessarily culminate in

---

[31] J. B. Carroll, "A Model of School Learning," *Teachers College Record* 64 (1963): 723–33.

[32] Clark, "Personalized Learning and Achievement," 3.

[33] Carroll, "A Model of School Learning," 725.

[34] Clark, "Personalized Learning and Achievement," 4.

[35] Fred S. Keller and J. Gilmour Sherman, *The Keller Plan Handbook* (Menlo Park, CA: W. A. Benjamin, 1974), 15.

[36] Keller and Sherman, *The Keller Plan Handbook*, 20.

[37] Keller and Sherman, *The Keller Plan Handbook*, 17.

project-based expressions but in standardized final tests.[38] The second key feature of PSI is the self-pacing of students through the pre-determined curriculum.[39] If mastery was not achieved by a student, then PSI relied on support from a proctor for the individual struggling with the information.[40] These features were not the only ones found in a PSI course, but they do compare nicely with modern perspectives of personalized learning.

Though Keller's goals of PSI seem to align with the goals of modern personalized learning—namely, that students demonstrate learning—there are distinct differences between the approaches. The recent push by some contemporary models is to design the learning system from the student's interests, goals, and individual learning styles.[41] While the skills required by the course are often driving the outcomes of the personalized learning class, the approach to get there can depend heavily on student choice. PSI differs; it offers a set curriculum, but it gives student's freedom in time restraints, increasing mastery requirements as a trade-off.[42]

Another difference between the PSI approach and some modern models concerns students' access to the professor (i.e., teacher or instructor). PSI suggests the use of proctors and written materials, instead of dependency on lectures, for information. Keller says, "Traditional teaching squanders society's investment in the education of the expert. The professor is too valuable to be assigned a large repetitive job that can be delegated to others, especially others can do it as well, if not better."[43] The professor's purpose seems to be to provide access to learning materials for students at differing

---

[38] Keller and Sherman, *The Keller Plan Handbook*, 20.

[39] Keller and Sherman, *The Keller Plan Handbook*, 24.

[40] Keller and Sherman, *The Keller Plan Handbook*, 33.

[41] Derek Wise, "Personalized Learning: Personalized Schooling," in *Personalizing Learning in the 21st Century*, ed. Sara de Freitas and Chris Yapp (Stafford, UK: Network Educational Press, 2005), 48.

[42] Keller and Sherman, *The Keller Plan Handbook*, 24.

[43] Keller and Sherman, *The Keller Plan Handbook*, 25.

paces. In some modern models of personalized learning, the teacher is the one tailoring instruction and offering individual materials to students in order to increase teacher knowledge of student needs and goal attainment and to provide students with deeper relationship access to teachers, thus leading to a gradual release of the learning responsibility to students. Zmuda, Ullman, and Curtis pose a key question of teachers seeking to incorporate personalized learning: "Do I trust my students to be true learning partners—in a dynamic rather than hierarchical exchange, one in which we collaborate often to frame tasks, evaluate progress, and consider next steps?"[44]

These subtle differences in approaches did not limit the success of PSI for its time and setting. It showed the capability of designing a program that is unique and catered to the pacing needed by students. The success of PSI is seen in the form of standardized test scores. There was a clear distinction between conventional classes and PSI classes. James Kulik, Chen-Lin Kulik, and Peter Cohen performed a meta-analysis of all the studies relating to PSI. They found that PSI outperformed conventional courses:

> The present study shows that PSI has an effect on student achievement in college courses; it also describes the size of this effect. PSI final examinations average about 8 percentage points higher than examinations from conventional classes; using Glass's index, the average effect size is .5. This means that PSI raises the final examination score of a typical student in a typical class from the 50th to the 70th percentile. It also means that PSI raises the performance of typical students (with SAT scores of 500) to the level previously associated with above-average students (with SAT scores of 600).[45]

With such a significant result in ability to change student success scores, why did PSI become less and less discussed until it faded into dark library stacks? According to Clark, "PSI has fallen into general disuse due to complicated definitions."[46] It seems that

---

[44] Zmuda, Ullman, and Curtis, *Learning Personalized*, 102.

[45] James A. Kulik, Chen-Lin C. Kulik, and Peter A. Cohen, "A Meta-Analysis of Outcome Studies of Keller's Personalized System of Instruction," *American Psychologist* 34, no. 4 (April 1979): 317.

[46] Clark, "Personalized Learning and Achievement," 27.

defining PSI for repeat usage and implementation was a struggle that prompted its disuse, regardless of efficacy.[47]

Clark's outline of the evolution of personalized learning from Bloom's to Keller is not the only origin story. While there are clear traces from mastery learning to the development of modern models of personalized learning, there are also logical lines of thought found in theories of learning that also arrive at the destination of personalized learning.

Rousseau's *Emile* and personalized learning. Garcia-Delmuro suggests that the origin of personalized learning traveled from Rousseau's *Emile* to John Dewey to Maria Montessori.[48] It was not, however, that these authors had created a perfectly composed model of personalized learning. As research tends to do, ideas from one individual were built upon by another until a modern understanding of theories on child-centered instruction and individualized knowledge construction was developed. Some of the original ideas can be traced back to Rousseau.

Rousseau has been cited as a prompter for educational reform movements, and he has been considered as a source for several educational movements.[49] One reason is Rousseau's usage of the concept of freedom in *Emile*. Freedom in education is a key factor in *Emile*. It should be considered a foundational element of the personalized learning reform, too. Rousseau's concept of freedom is seen in several presentations throughout *Emile.*

---

[47] If Clark is correct and PSI fell to the wayside because of its complexities, then modern personalized learning is at risk as well. There is little agreement about its terms, elements, and benefits. Order needs to occur for the sake of saving a promising approach to education.

[48] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 23.

[49] Scott Walter, "The 'Flawed Parent': A Reconsideration of Rousseau's '*Emile*' and Its Significance for Radical Education in the United States," *British Journal of Educational Studies* 44, no. 3 (1996): 262.

Rousseau's intention of liberating students from systems of education was a way to prepare students for more accurate real-life experiences. Doing so would provide deeper knowledge. Rousseau says, "Our first masters of philosophy are our feet, our hands, our eyes. To substitute book for all that is not to teach us reason. It is to teach us to use the reason of others. It is to teach us to believe much and never to know anything."[50] The ability for a student-centered actual experience is related to the *elements* of modern understandings of personalized learning.

Personalized learning often provides an alternate means of learning for students who do not fit the traditional education system. Zmuda, Ullman, and Curtis suggest: "Compared to the outdated approaches of transmission, retention, and recall, personalized learning allows for deeper, more lasting learning in an engaging and relevant environment."[51] This idea of removal from systems is also seen in *Emile*. Rousseau also sees the need to relieve education of failed systems. Rousseau states, "Nor do I count the education of society, because this education, tending on two contrary ends, fails to attain either. It is only fit for making double men, always appearing to relate everything to others and never elating anything except to themselves alone."[52] Rousseau maintains this perspective throughout his work. More importantly for this research project, however, the idea of removal from systems shows a foundational ideology in personalized learning: every student cannot fit into the machine of education and be expected to produce exactly the same results.

Presentation of the Research Problem

Researchers have shown personalized learning to be a difficult phenomenon in education to define effectively. One problem is that personalized learning is often

---

[50] Jean-Jacques Rousseau, *Emile, or On Education* (New York: Basic Books, 1979), 125.

[51] Zmuda, Ullman, and Curtis, *Learning Personalized*, 7.

[52] Rousseau, *Emile*, 41.

comprised of elements of personalized learning in various settings. The ability to identify elements and benefits of personalized learning may add to the understanding of a reliable model of personalized learning that may allow for further student success. The lack of clarity offered by research on the terminology, elements, and benefits of personalized learning are hindering its development.

Current Status of the Research Problem

While there are many researchers beginning to tie together the intricacies of personalized learning, there is still a need for further research. There are a several who are seeking to determine the effectiveness of implementing personalized learning. One example is the Carnegie Corporation of New York, which designed and opened several high schools in 2013.[53] The schools were designed for the purpose of measuring the effectiveness of several strategies, one of which is personalized learning.

A recent publication by the Rand Corporation describes the implementation of personalized learning dynamics in these schools, presenting four findings. First, teachers are consistently implementing personalized learning strategies. Second, they have found the creation of personalized assignments difficult. Third, students are using online personal learning software. Fourth, students have a choice in their instructional material and topics.[54] These popular studies on personalized learning, combined with the recent interests of the United States Department of Education and the United Kingdom's pushing for the implementation of personalized learning, have increased interest among educational bodies. There is a new growth in literature regarding personalized learning. Many of those sources are secondary and theoretical. Yet, many are scholarly research completed in an education-related field. As stated above, there still remains a disconnect

---

[53] Elizabeth Steiner et al., *Designing Innovative High Schools: Implementation of the Opportunity by Design Initiative after Two Years* (Santa Monica, CA: RAND, 2017), xi, https://www.rand.org/pubs/research_reports/RR2005.html.

[54] Steiner et al., *Designing Innovative High Schools*, 16.

among the literature regarding personalized learning's terminology, elements, and benefits.

Research Purpose

The specific ordering of terminology, elements, and benefits of this educational approach will be meaningful for developing a more common understanding of personalized learning. For the Christian education sector, personalized learning offers promising insight into ways in which institutions take their already successful student population and press them into the next level of success. For the public sector, the intention of the present research endeavor is to further the discussion of personalized learning by engage existing dissertational studies and ordering the research previous completed on the subject. Connecting insights in dissertations from a broad range will help add order to those who are studying personalized learning. Any identifiable patterns in terminology will assist the understanding of personalized learning. Correct terminology, combined with an ordering of the benefits of personalized learning, would be a powerful asset to any secondary school—public or private—interested in adopting a model of personalized learning. The research questions below reflect these purposes.

Research Questions

1. Are there any identifiable commonalities in terminology regarding personalized learning in these studies?
2. What elements and benefits of personalized learning emerge from the collected dissertational studies?
3. What does an analysis of personalized learning implementations in the secular school systems offer Christian education?

Delimitations of the Proposed Research

Narrowing the research from the wide range of educational settings is important for the development of a feasible research project. Therefore, the delimitations of this research have been set with that goal in mind. The research does not include

individualized learning plans (IEP). The current understanding of IEP is solely in relation to special education. This research focuses on the general population of typically developing students in grades 9–12. While technology is included as an element of personalized learning (considered rightly a tool), this research does not include investigation into the many technologies available and branded as personalized learning.

Definition of Research Population

The research population for this study consists of dissertational studies dating back ten years (2019–2009) available as published on the ProQuest Dissertation and Thesis database. Various qualitative, quantitative, and mixed-methods dissertations will be included in the study for the purpose of gathering a robust population sample.

Description of the Research Sample and Sampling Technique

The research sampling used in this study is a selective or purposive sampling technique that also employs a census of that selected sample.[55] The population samples are taken from a specified body of literature: the ProQuest Dissertation and Thesis database. The samples are selectively narrowed further by inclusion guidelines set by this study. All dissertations meeting those guidelines are included. The intention of selectively sampling and taking a census of dissertations is to further the understanding of personalized learning.

Delimitations of the Samples

There are several delimitations for this research. The research does not focus on implementations of personalized learning models that rely solely on the usage of a software. However, usages of some types of technology in a model of personalized

[55] Paul D. Leedy and Jeanne Ellis Ormrod, *Practical Research Planning and Design*, 11th ed. (New York: Pearson, 2016), 262.

learning are included. The research does not measure elementary, middle, or post-secondary institutions; therefore, there is no inclusion of dissertations that focus on grades K–8 or the collegiate level. Further, this research focuses on personalized learning, not *individualized learning*, which is commonly referred to as the method of instructing non-typically developing students in a special education setting.

Terminology

Personalized learning. This term refers to the phenomenon in education that attempts to tailor-fit skills and knowledge acquisition to the uniqueness of a student.

Personalized education. This term is synonymous with personalized learning.

Elements of personalized learning. This phrase refers to the components of personalized learning. Often, these components are already implemented educational strategies that have been realigned with an ideal personalization of learning.

Models of personalized learning. This phrase refers to the various combinations of elements of personalized learning.

Overview of Methodological Design

By investigating the origins of personalized learning, I discovered a study by Kulik, Kulik, and Cohen from 1979 that presented the findings of the Personalized System of Instruction originating with Fred Keller. Kulik, Kulik, and Cohen gathered research concerning the PSI model implemented in college courses. Their findings showed that PSI courses were significantly more successful than traditional college course during that time.[56] Yet, the methodology of implementing a meta-analysis was also intriguing. The concept of a meta-analysis, combined with the problem of ordering terminology surrounding personalized learning, seems to best match a content analysis

[56] Kulik, Kulik, and Cohen, "A Meta-Analysis of Outcome Studies," 317.

approach. This research is a meta-analysis of dissertational studies using content analysis techniques.

Dissertations are carefully selected by preset guidelines for inclusion. Those dissertations are then entered into *NVivo 12* software and coded. After coding, preset queries existing in the software are used for analysis. The resulting patterns and answers to the research questions are recorded and presented.

Instrumentation

The instrumentation utilized in this research endeavor is the *NVivo 12* qualitative content analysis software produced by QSR International. *NVivo 12* is designed to analyze large amounts of information. This research utilizes *NVivo 12* to isolate data in four ways: (1) word frequency, (2) coding combination query, (3) matrix coding, and (4) crosstab query. These queries allow for the identification of patterns in the terminology, elements, and benefits of personalized learning.

CHAPTER 2

PRECEDENT LITERATURE

The amount of literature concerning personalized learning and education has increased in the past ten years. Dissertations, scholarly articles, books, and organizational publications are all recent contributions to the development of personalized learning. The variety of research demonstrates the disaccord in the terminology, elements, and benefits of personalized learning. This chapter surveys the educational literature surrounding personalized learning. My intention here is not to offer an exhaustive survey of all literature related to personalized learning but to demonstrate the disarray in terminology, elements, and benefits. First, however, I consider the biblical-theological foundations of personalized learning as a means of translating its usefulness to the Christian education sector.

Biblical-Theological Foundations for Personalized Learning in Christian Education

The biblical-theological foundations of personalized learning rely on the existence of a personal God who is unique in himself and has made humanity like himself. Alvin Plantinga points out that God, who is personal, has a will, an intellect, affections, knowledge, and others traits of personhood.[1] These characteristics are passed on to humanity as a result of the *imago Dei* (i.e., "image of God"), which is a Christian belief based on the biblical account of creation found in Genesis 1:26: "Then God said, 'Let us make man in our image, after our likeness.'"[2] The *imago Dei* is what makes

[1] Alvin Plantinga and Michael Tooley, *Knowledge of God* (Malden, MA: Blackwell, 2008), 2.

[2] Unless otherwise noted, all Scripture quotations come from the English Standard Version.

humankind different from the entirety of creation. No other animal or thing in the world has been given such a status, and no one or thing functions like humans do. Many theologians have worked diligently to identify what specifically makes humankind unique among creation.

There are five views of the *imago Dei* that show the distinctions of human creation and help inform the purposes of personalized learning: substantive, relational, functional, teleological, and holistic.[3] Each of these views focus on an aspect of humanity. The *substantive* view suggests that "reason and freewill,"[4] along with "some definite characteristic or quality within the makeup of the human,"[5] are what sets humans apart in the world. The *relational* view suggests the image of God in men and women is most visible through the human capacity for deep and meaningful relationships.[6] The *functional* view points out the abilities of humanity to order and work in the world over which humanity has been given dominion.[7] The *teleological* view suggests that the capability and process of humanity to become like Christ is the hallmark characteristic representing the image of God.[8] Lastly, the *holistic* view of the *imago Dei* advocates that each of the other views only highlight a part of how humanity represents God's image and likeness; these parts fit neatly together to demonstrate God's distinct image in humanity.[9] The Christian concept of imago Dei also touches idea of human's as God's representatives on earth.

---

[3] Gregg R. Allison, "Humanity, Sin, and Christian Education," in *A Theology for Christian Education*, by James R. Estep Jr., Michael J. Anthony, and Gregg R. Allison (Nashville: B & H Academic, 2008), 180.

[4] Allison, "Humanity, Sin, and Christian Education," 179.

[5] Millard J. Erickson, *Christian Theology* (Grand Rapids: Baker Academic, 2013), 460.

[6] Erickson, *Christian Theology*, 463.

[7] Erickson, *Christian Theology*, 466.

[8] Allison, "Humanity, Sin, and Christian Education," 180.

[9] Allison, "Humanity, Sin, and Christian Education," 180.

Peter Gentry and Stephen Wellum define the *imago Dei* with more specificity concerning the purpose of humanity's placement on Earth: "In the ancient world, the concept of the 'image of the god' conveys the idea of a physical representation of the 'god,' which underscores how Adam and the entire human race are viewed as vice-regents who are to rule and function in the place of God, as God's representatives, as God's servant-priest-kings."[10] If humankind are to be considered God's vice-regents, then it stands to reason that their learning-style preferences and unique interests be considered in educational approaches intended to teach them. An application of personalized learning from a Christian perspective offers such respect. Furthermore, the many views articulating the distinguishing features of humanity are directly connected to characteristics found in each person of the Godhead.

Respect for the Unique Creature

Wayne Grudem says, "If we ever deny our unique status in creation as God's only image bearer, we will soon begin to depreciate the value of human life, will tend to see humans as merely a higher form of animal, and will begin to treat others as such."[11] The uniqueness of each human creature supports a theological basis for personalized education in the Christian educational setting and respects the image-bearing status of human beings. To respect a man or woman, boy or girl, is to respect the Creator.[12] Some elements of personalized learning offer a way to respect the creatureliness of students and

[10] Peter J. Gentry and Stephen J. Wellum, *Kingdom through Covenant: A Biblical-Theological Understanding of the Covenants,* 2nd ed. (Wheaton, IL: Crossway, 2018), 527.

[11] Wayne A. Grudem, *Systematic Theology: An Introduction to Biblical Doctrine* (Grand Rapids: Zondervan, 2000), 450.

[12] Gregg Allison says, "Whatever any individual human being is and does that is good, and whatever the collective human race is and does that is good—all of these are the result of creation in the divine image and the common grace of God to his human creatures. And all of this is worthy of applause and thanksgiving—to both creature and Creator." Allison, "Humanity, Sin, and Christian Education," 178.

the Creator God who made them. One way to recognize this uniqueness is to respect the physiological nature of information reception in human beings.

As John Clarke says, "Learning . . . is always personal."[13] The physical design of humankind hints to the unique personalized nature of learning. Humans are born with senses that allow us to interact with the world. Those interactions are taken in from multiple senses and housed in one center for access and storage through unmatched intelligence. What is learned is a singular individualized experience with the outside world. The design of the Creator suggests that every human experience in this life is personal. Through the individual eyes, ears, mouths, noses, and touches of each human being, God allow learning to happen. It is also through personalized expressions that people share knowledge.[14] If receptions and expressions of learning are personalized by physical design, then it is reasonable to consider its existence when creating an educational system. Personalized learning is maximizing learning built upon the unique modes of input and expression found in the individual person. Personalized learning is one approach to education that demonstrates respect for the individual and design of the creature.

This research project considers personalized learning to support and respect the design of God's image bearers. However, personalized learning best aligns with a holistic perspective that includes the substantive, relational, functional, and teleological views of the *imago Dei*. The holistic perspective considers the entire student to be made in God's

---

[13] John Clarke, "Personalized Learning and Personalized Teaching," in *Personalized Learning: Preparing High School Students to Create Their Futures*, ed. Joseph DiMartino, John Clarke, and Denise Wolk (Lanham, MD: Scarecrow Education Press, 2003), 71.

[14] That people share knowledge through personalized expressions is the basis from which arguments for the existence of the four Gospels originate. Essentially, each of the disciples experienced Christ in a particular way and remembers specific facts personalized for them. They then communicated specific parts of the story for the hearers for whom they were writing. The larger genre focus of Scripture also supports this theory. Individuals experience God through the Holy Spirit and write what they are given. Their writings are flavored with their culture, time, and season of life. How vast is the knowledge of God!

image. God has equipped each student with reason, the capacity for relationships, the ability to order information, and—for the Christian—the ability to be conformed into Christ's image. It helps educators approach teaching and learning as a unique and personal experience. Together, they help inform and suggest a rationale for personalized learning in a Christian environment.

As human beings, our created capacity to comprehend, learn, and grow are bestowments that are pictures of God. The *imago Dei* informs the personhood of the student, which helps to further this study's purpose in seeking to find cohesiveness in the terminology, elements, and benefits of personalized learning. This study seeks to clarify personalized learning as a means to continue supporting the unique student as demonstrated in his or her individual representation of the *imago Dei*. One way personalized learning can fit within Christian education is through a holistic perspective on Christian formation.

Christian Formation

"Christian formation is the central tenet of Christian education," says James R. Estep and Jonathan H. Kim.[15] Christian formation is the idea of becoming like God in every way we can. This aspect is important because personalized learning offers a unique way to value the uniqueness of each student and tailor-fit a Christian formation growth plan to him or her. The foundation of Christian formation is based on developing Christians to look more and more like Jesus across their lifetimes. This process should include some form of education because such is the example found in Jesus's life.

Luke 2:52 reads, "And Jesus increased in wisdom and stature and in favor with God and man." Jesus himself grew, as people do. As part of his humanity, Jesus had to learn. Bruce A. Ware says, "As a boy, Jesus learned, no doubt, through the instruction of

[15] James R. Estep Jr. and Jonathan H. Kim, eds., introduction to *Christian Formation: Integrating Theology and Human Development* (Nashville: B & H Academic, 2010), 4.

his parents, and from the teaching of the rabbis in his hometown of Nazareth, and through his own diligent reading of God's Word."[16]

Christian formation broadly describes the process of a Christian growing into maturity and Christlikeness. As James Estep writes, "Education that glorifies God is one that transforms individuals into mature followers of Jesus Christ."[17] Personalized learning translated to Christian education can offer valuable ways to develop Christians,[18] thus making this study appropriate in order to further personalized learning. Educators who have seen their role as connected to only the intellectual development of a student can now move toward a holistic approach to supporting all aspects of a person as interconnected. Jonathan Kim provides great insight into the movement from methodology only concerned with intellectual development toward a holistic development that includes a personalized learning relationship mirroring Christ's example of education with his disciples:

> In order to promote holistic Christian formation, nurture, denoting holistic pedagogy, has to become a central methodology in the church and school. One important feature of this pedagogy is on the dialogic impartation of the whole knowledge-involving theory (i.e., theoria), practice (i.e., poiesis), and critical-reflection (i.e., praxis). Teaching under this perspective focuses on dialogic learning where the synthesis of both conceptual and perceptual knowledge leads to transformation and growth.
>
> Moreover, because the pedagogy of nurture is relationally driven, it demands, most of all, that teaching be done in a koinonic context, relationally—just as Christ, the master teacher, taught His disciples. In order to teach relationally, however, the institutional context of which students are a part needs to become a koinonic community where teachers function as mentors and role models rather than mere instructors. Such teaching then promotes interaction and cooperation between students and teachers, creating an unbreakable bond in Jesus Christ.

---

[16] Bruce A. Ware, *The Man Christ Jesus: Theological Reflections on the Humanity of Christ* (Wheaton, IL: Crossway, 2013), 49.

[17] James R. Estep Jr., "Toward a Theologically Informed Approach to Education," in Estep, Anthony, and Allison, *A Theology for Christian Education*, 265.

[18] Estep and Kim note, "Christian formation can be influenced by the ministry of the church and glean valuable insights from the social sciences." Estep and Kim, *Christian Formation,* 5. The social science in this case is personalized learning. The value is connected directly to more effectively pressing students toward a personal relationship with Jesus Christ.

> What people need is holistic nurture from which the complete knowledge of faith is conceived and perceived. Only then will our people understand the true picture of faith and be able to grow into the image and likeness of Jesus Christ who is the Source and Perfecter of our faith (Hebrews 12:2).[19]

Personalized learning is a way to offer a nurturing and holistic approach to education. It can potentially provide a sounder, and more theologically informed, educational environment.

In short, personalized education in the Christian school setting can add to the overarching goal of Christian education that Gregg Allison writes about. Allison says that another part of Christian education's goal is "to shape people with remarkable physical, intellectual, creative, social, and relational abilities so as to further their transformation into the image of Christ. Encouraging Christ followers to reorient the use of their God-given gifts from selfish ends to God-honoring ones . . . is the high calling of Christian education."[20] Shaping students' unique abilities respects the God who made them as well as their distinct giftings. The theological connections between personalized education, Christian education, and theology can be seen in the Holy Spirit's gifting, the uniqueness of human creatures, and the Christian formation goals of education.

The Array of Research on Personalized Learning

The purpose of this research is to show the need for consistency in the terminology, elements, and benefits of personalized learning in an effort to equip the Christian student in furthering his or her uniqueness and Christian formation. The assumption is that consistency will offer insight into any interested party seeking to implement personalized learning strategies. The following discussion makes two points: (1) there are various approaches, elements, benefits, and problems concerning

---

[19] Jonathan Kim, "Intellectual Development and Christian Formation," in Estep and Kim, *Christian Formation*, 93–94.

[20] Allison, "Humanity, Sin, and Christian Education," 191.

personalized learning; (2) each author studied a different approach to personalized learning, resulting in the need for ordering its terminology, elements, and benefits.

Implementations of Personalized Learning

There are many claims about the benefits of personalized learning. For this research, some are justifiable, and some are not. The misinformation and misunderstanding surrounding personalized learning can hinder its successful implementation. In 2019, Ces'Ari Racine Garcia-Delmuro used qualitative techniques to explore the usage of a particular model of personalized learning (i.e., *Pinnacle Learning*) as implemented in charter schools.[21] Garcia-Delmuro sought to answer research questions related to the impact of training for teachers, implementation by teachers, understanding of the teacher's role, and barriers to implementation of elements of personalized learning.[22]

Garcia-Delmuro also presents the need for schools to rely on not only a singular system of personalized learning but also on the teachers who "are the key to personalizing learning beyond whatever programs provide."[23] Beyond offering several insightful ways to implement personalized learning in a school, Garcia-Delmuro's findings regarding personalized learning programs are relevant to the present research undertaking and hint at the need for it. Concerning one finding, Garcia-Delmuro accurately describes the advertising nature of some personalized learning programs that offer to be "the silver bullet that closes the opportunity gap."[24] How would a school

---

[21] Ces'Ari Racine Garcia-Delmuro, "Teacher Experience with Personalized Learning: Training, Program Elements, and Teacher Role at Two Low SES Schools" (EdD diss., University of California, Los Angeles, 2019), 127.

[22] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 17.

[23] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 120.

[24] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 120.

district, private or public, seeking to find unbiased information about the common elements and benefits of personalized learning learn of a better approach? Garcia-Delmuro highlights a unique problem offered by many premade models of personalized learning. The *silver bullet* is meant to be personalized learning; yet, even if it were a magic cure-all, the implementation of models has proven to be problematic.

Personalized learning has been shown to be implemented inconsistently by teachers across districts. In 2018, Michael Sereno designed a study in hopes of measuring the effects of personalized learning on student achievement.[25] He did so by quantitatively measuring test scores from the spring semester to fall semester on the *Measure of Academic Progress* reading and mathematics assessment. Sereno then used a survey to determine the educator's level of personalized learning. Sereno's survey used measures for principle components of personalized learning. One of Sereno's findings was that teachers implemented personalized learning in various ways across the district.[26] Sereno did, however, uncover the need for further research on the effectiveness of personalized education strategies on student success.[27] The question of accuracy arises due to varied implementation of personalized learning by teachers in the district. A solution to implementation problems could be resolved by a hands-on conceptual model with which teachers could implement personalized learning.

In 2018, Matthew Paul Thomas studied the effects of personalized learning in a secondary school environment that implemented several aspects of personalized learning.[28] Thomas used a case study model to investigate two research questions: "How

---

[25] Michael A. Sereno, "The Impact of a Personalized Learning Framework on Student Achievement" (EdD diss., Edgewood College, 2018), 3.

[26] Sereno, "Impact of a Personalized Learning Framework," 79.

[27] Sereno, "Impact of a Personalized Learning Framework," 79–80.

[28] Matthew Paul Thomas, "Personalized Learning: A Case Study of Supporting Literature Applied to Practice and Implementation in a High School" (EdD diss., University of Pittsburgh, 2018), iv.

is personalized learning described in a school professing to implement 'personalized learning'? How does the concept of personalized learning in a school map onto seven guiding supports of personalized learning strategies drawn from the literature?"[29]

Thomas then developed a potential conceptual framework of how a school would implement the personalized learning. However, through the discovery of information in the various innerworkings of the case study, he saw the need to change that conceptual framework.[30] Upon completion of the study, and with input gathered, Thomas came to the conclusion that the components of the framework seemed to fit the implementation of personalized learning, but the conceptual framework's movement was better understood as a heuristic model.[31]

Thomas's work exposes the need for a heuristic model, but also demonstrates the need for further understanding personalized learning as a whole. If teachers had access to the clarified terminology, elements, and benefits of personalized learning, then perhaps they could more readily implement a model in the classroom.

Elements of Personalized Learning: Student Plans and Student-Directed Pacing

Elizabeth Beese's main research question was "What patterns exist in high schools' organizational designs for creating and carrying out personalized learning goals and plans for individual students?"[32] Her chosen method of research was a qualitative case study of three high schools. Beese chose three high schools to include in her case study. These schools were chosen based on seven criteria: (0) the school must be a public

[29] Thomas, "Personalized Learning," 6.

[30] Thomas, "Personalized Learning," 133.

[31] Thomas, "Personalized Learning," 135.

[32] Elizabeth Brott Beese, "How Do They Do It? Describing Nontraditional Designs for Creating and Carrying Out Personalized Plans for Learning in Three High Schools" (PhD diss., Purdue University, 2018), 39.

U.S. high school; (1) the school must have nontraditional organizational designs for personalized planning for learning; (2) preferred schools will have larger percentage of school day/curriculum affected by personalized planning for learning; (3) preferred schools will have frequent rather than infrequent rounds of personalized planning for learning; (4) preferred schools will have greater extent and profundity of student active input into personalized planning for learning; (5) preferred schools will have higher level of institutionalization of systems for planning and managing personalized learning; and (6) the school must be located in the U.S. northeast.[33] The schools chosen to be studied were Vermont's Saluki District High School, Connecticut's Station House, and New York's Action Alternative School.[34]

The overall focus of Beese's study was the organizational designs that lend themselves to personalized education in the schoolwide system.[35] Her findings resulted in the identification of thirty-seven processes that contribute to each school's personalized learning emphasis.

Yet, the finding of interest to the present research endeavor concerns the creation of individual students' goals. Beese says, "Notable findings include the fact that most bespoke planning-for-learning processes in the cases studied were triggered by predictable calendar-based cycles, rather than by unique student information or choice."[36] The lack of planning based on student need or interest seems to fly in the face of most understandings of personalized learning. Beese speculates that the lack in this area may be due to limited resources and the intensity of maintaining individualized lesson plans

---

[33] Beese, "How Do They Do It?," 43. The original numbering of Beese's criteria have been preserved (i.e., 0–6).

[34] Beese, "How Do They Do It?," 45.

[35] Beese, "How Do They Do It?," 107.

[36] Beese, "How Do They Do It?," 107.

and ensuring their success.[37] Beese also notes, "A final observation worthy of future research was that high quality, formally-recorded information about students seemed to be not just important for ethical planning by teachers for students; but seemed to be of real practical help to students planning for themselves."[38] The development of a personalized learning model that incorporates elements making the most of the resources is needed. The present research project seeks to further the understanding of personalized learning and thereby provide a tool for implementation.

The Need for Models and Benefits of Personalized Learning

Considering personalized learning as elements contained in a model could offer a way to better serve students in the classroom. John-Patrick G. Clark published his research regarding personalized learning, student engagement, and achievement. He investigated schools in Kentucky that had begun using a programed named "kid•FRIENDLy."[39] Clark looked at the data from self-reported scores of stakeholders who, to varying degrees, made use of the program's personalized learning elements. He then sought to measure the effect of personalized learning on student engagement and of student engagement on student achievement. The results were somewhat surprising.

Literature suggests that the effect of personalized learning on student achievement should be clearly evident and measurable. Unfortunately, Clark's research showed no significant relationship to student achievement.[40] Clark notes that this could be due to the difference of looking at personalized learning from the broader school and district level than the classroom level. Clark also observes that the lack of a significant

---

[37] Beese, "How Do They Do It?," 108.

[38] Beese, "How Do They Do It?," 109.

[39] John-Patrick G. Clark, "Engagement's Mediation of the Relationship between Personalized Learning and Achievement" (EdD diss., Western Kentucky University, 2017), 60.

[40] Clark, "Personalized Learning and Achievement," 74.

relationship between student achievement and personalized learning could be due to the measurement of personalized learning as a whole and not the measurements for the individual elements contained in that whole.

Clark's research shows the need to consider personalized learning as elements that fit together to create a model. Personalized learning identified as individual elements could be traced more effectively to their benefit (such as student achievement in this case).

The benefits of personalized learning are not limited to academia; they are also seen in the interpersonal relationships between teachers and students. In 2017, Dustin D. Barrett found that personalized learning can potentially reduce the amount of negative behavior in a classroom.[41] Employing a mixed-methods design on a population of three high schools, Barrett investigated mastery-based personalized learning and at-risk students. His goal was to "provide possible insight to increase the use of this instructional model into larger high schools in the district."[42] The model of personalized learning Barrett measured was based on blended learning and mastery. The survey he used included several personalized learning-related questions.[43]

Barrett's findings demonstrate the benefits of personalized learning. In one finding, Barrett says, "Behavioral data indicates that transforming to a mastery-based, personalized learning model delivered through blended instruction has the ability to reduce the behavior infraction rates of at-risk high school students."[44] The reduction of behavioral infractions of students may come at a price. Barrett expresses concern that a

---

[41] Dustin Dale Barrett, "A Mixed Methods Study to Measure the Impact of Mastery-Based, Personalized Learning on At-Risk Student Achievement" (PhD diss., Northwest Nazarene University, 2017).

[42] Barrett, "Mastery-Based, Personalized Learning," 57.

[43] Barrett, "Mastery-Based, Personalized Learning," 160.

[44] Barrett, "Mastery-Based, Personalized Learning," 128.

traditional model of public education may not have the flexibility needed to bed restructured to a completely personalized learning model.[45] The price to be paid could be many parts of the traditional model of education. Barret is not the only researcher recording positive benefits of personalized learning.

Benefits of Personalized Learning:
Teacher and Student Relations

Personalized learning has been found to positively effect teacher and student relationships. Andrea Yeager Neuzil discusses these findings in her dissertation, which is about the correlations between student engagement, personalized learning, and poverty levels.[46] Neuzil used correlational quantitative research methods to describe the relationship between student perceptions of personalized learning and student engagement.[47]

Neuzil's findings showed an overall positive effect of personalized learning on student engagement. Personalized Learning in Neuzil's context focuses more on teacher and student relationships. The following topical categories were surveyed of students: teachers know me; teachers know how I learn; teachers ask me student choice; and learning with others.[48] The overall positive effect demonstrates that personalized learning implemented in schools can aide the effort to engage students from a low socioeconomic background and increase their engagement as a means to increase achievement.

Barrett and Neuzil show benefits of personalized learning topics connected to the personal relationships of teachers and students. Neuzil found the positive increase in

---

[45] Barrett, "Mastery-Based, Personalized Learning," 136–37.

[46] Andrea Yeager Neuzil, "Equitable Student Engagement: A Correlation between Personalized Learning, Student Engagement, and Poverty Level" (EdD diss., University of Nebraska at Omaha, 2016).

[47] Neuzil, "Equitable Student Engagement," 40.

[48] Neuzil, "Equitable Student Engagement," 70–81.

personal relationships between teachers and students in a low socioeconomic setting to be affected by personalized learning. Barret found a reduction in reported student infractions of reported student infractions connected to personalized learning.

There is, however, a keen problem with the research findings discussed above; they are hopeful, but they not readily available for the consumption of educational institutions seeking their implementation. Not only that, there were several different models of personalized learning examined by each study above. Each author represents a different presentation of personalized learning. Further research is needed to clarify personalized learning. This reality points to the need for a meta-analysis of personalized learning. One that would offer insight into the terminology, elements, and benefits of personalized learning as seen in research findings surveyed above.

RAND's Personalized Learning Research

A major study conducted by RAND Corporation suggests that the best understanding of personalized learning is through an elements-and-models approach. The research by RAND focused on sixty-two schools that received grants to implement personalized learning elements. RAND measured the growth of student achievement using the Northwest Evaluation Association's Mathematics and Reading Assessment in the 2014–2015 school year.[49] Their findings showed correlations between higher student achievement and the implementation of elements of personalized learning, suggesting its positive benefits and its place in current education. However, RAND's work demonstrates the same problems found in the research examined above: it offers yet another approach to personalized learning and suggests its own terminology, elements,

[49] John F. Pane et al., *Informing Progress: Insights on Personalized Learning Implementation and Effects* (Santa Monica, CA: RAND, 2017), 2, https://www.rand.org/pubs/research_reports/RR2042.html.

and benefits of personalized learning. Below is a synopsis of RAND's work that highlights its key features.

There was variation in how and which elements were implemented in the different schools. RAND measured five strategies (see below) through site visits, interviews, and surveys in order to measure the effectiveness of personalized learning strategies. Their findings showed that the scores in mathematics and reading increased in a majority of schools when compared to differing interventions.[50] In RAND's study, public charter schools that implemented personalized learning strategies showed more significant increases in student success than instruction in a large group format.[51] There were several characteristics of personalized learning that correlated to most successful practices.

The five elements of personalized learning investigated by RAND were (1) learner profiles, (2) personal learning paths, (3) competency-based progression, (4) flexible learning environments, and (5) college and career readiness.[52] *Learner profiles* are described as a "variety of data" and are used to inform teacher's educational decisions. Some schools in RAND's research endeavor implemented the personalized aspects of data, such as "personalized goals" and "discussing data with students." *Personal learning paths* are "the extent to which students were able to make choices about their learning varied by course, teacher, and age of the student." This aspect could involve "project based learning," a "personalized path through content," or "out-of-school learning opportunities." RAND found that many of the schools did not offer a specifically personalized out-of-school educational experience. *Competency-based progression* occurs when students move on to advancing tasks after the demonstration of

---

[50] Pane et al., *Informing Progress*, 8.

[51] Pane et al., *Informing Progress*, 13.

[52] Pane et al., *Informing Progress*, 14.

successful skills. This element was the least implemented element of personalized learning in the aggregate. *Flexible learning environments*, in RAND's definition, concern the amount of time students are in regularly scheduled daily learning opportunities that "meet student needs." The reporting schools offered extended days and school years as well as flexible teaching positions in order to support flexible learning environments. Lastly, *college and career readiness* is defined as preparing students for life outside of high school in a non-academic way. This preparation was reportedly achieved through advisory curricula, cooperative learning strategies, and increasing awareness of options after high school.

The results of RAND's research did not determine the exact personalized learning elements that had the greatest effect on the growth in student achievement.[53] The research team was, however, able to identify the presence of a few personalized learning subelements implemented at the schools: (1) student grouping, (2) learning space supports model, and (3) students discuss data. These elements were used in arrangement with one another to some degree.[54] RAND's research suggests that no singular element of personalized learning can be incorporated to increase student achievement, but an amalgamation of personalized learning elements could be more effective. Therefore, RAND's findings suggest that further research with the purpose of ordering personalized learning is needed.

---

[53] John F. Pane, "Strategies for Implementing Personalized Learning While Evidence and Resources Are Underdeveloped" (Santa Monica, CA: RAND, 2018), 28, https://www.rand.org/pubs/perspectives/PE314.html.

[54] Each of RAND's personalized learning elements has subcategories related to the overarching main categories listed above. Of those thirteen total categories, these three were identified present in the schools with greatest gains. For more information on this, see Pane et al., *Informing Progress*, 28–30.

Further Literature Concerning Personalized Education

As with many topics in education, there is a fair amount of literature concerning personalized learning available for the educational investigator. However, the same difficulty of inconsistent terminology and the various disagreements concerning the elements that should be included in personalized learning models again show the need for a convergence of information. I will now examine several resources concerning personalized learning and then discuss the suggested models, benefits, and elements of personalized learning.

In 2001, Dianne Ferguson et al. published *Designing Personalized Learning for Every Student*, whose purpose is to describe "a process for individually tailoring curriculum and learning so that every student has a unique learning experience that serves the student's growth, competence, and community participation."[55] There are several points made in this book related to the development of a personalized learning environment.

Ferguson et al. suggest that developing the curriculum to include respect for varying individual intelligences will grow the personalized learning focus.[56] A suggested approach to learning about individual students in a given classroom is by using the activity-based assessment (ABA).[57] The ABA is an inventory that utilizes teacher observations of student preference cross-referenced with information from the family. If it is age appropriate to have the student write, the student would also complete a questionnaire to add to the information gathered. The details could then be utilized by teachers to build a personalized learning opportunity for the student. Another suggested

---

[55] Dianne L. Ferguson et al., *Designing Personalized Learning for Every Student* (Alexandria, VA: Association for Supervision and Curriculum Development, 2001), 7.

[56] Ferguson et al., *Personalized Learning for Every Student*, 20.

[57] Ferguson et al., *Personalized Learning for Every Student*, 25.

approach of this book is the inclusion of the family in the curriculum design.[58] The approach considered effective by Ferguson et al. provides family meetings to discuss the direction of the curriculum. These meetings could be individual- or group-based.[59]

In 2008, Joseph DiMartino and John H. Clarke authored *Personalizing the High School Experience for Each Student*, arguing for the need of personalized learning. The problems they identify as most pertinent are (1) depersonalization in current secondary school settings, (2) lack of adult support, (3) unresponsive teaching, (4) imperceptible results, (5) invisibility, and (6) isolation.[60] *Depersonalization* is described as "high schools offer[ing] few options that appeal to young people with distinctive interests." *Lack of adult support* describes the absence of meaningful relationships between students and educators. *Unresponsive teaching* is connected to a teacher's development of a singular lesson plan for all students regardless of individual preferences. *Imperceptible results* mean that students need motivation to continue their education. *Invisibility* describes the phenomenon that only the highest student achievers in most schools are recognized for their work. *Isolation* concerns conflicting goals that "high schools are designed to protect young people from exploitation by the adult world—at the same time they aim to prepare students for adult roles."[61]

DiMartino and Clarke go on to describe their solution to these needs through several implementations of personalized learning elements. Their overarching solution is the implementation of personalized learning plans. One of the necessary components they suggest developing is an advisory.[62] The advisory, if implemented in a school, would

---

[58] Ferguson et al., *Personalized Learning for Every Student*, 44.

[59] Ferguson et al., *Personalized Learning for Every Student*, 43–44.

[60] Joesph DiMartino and John H. Clarke, *Personalizing the High School Experience for Each Student* (Alexandria, VA: Association for Supervision and Curriculum Development, 2008), 5.

[61] DiMartino and Clarke, *Personalizing the High School Experience*, 6.

[62] DiMartino and Clarke, *Personalizing the High School Experience*, 16.

include a complete organizational development concerning the identification of goals for each student, roles of the personnel involved, and assessment of the advisory's effectiveness by students, teachers, leaders, and parents of students.[63]

The advisory program is a way to support the development of personalized learning plans (PLPs). PLPs are distinguished from IEPs (individualized educational plans). DiMartino and Clarke suggest that the two can be used simultaneously since they serve different purposes.[64] PLPs contain several parts but can be based on a simple foundation. The authors identified three questions that can be used as the basis for the development of PLPs: "Who am I? How am I doing? Where am I going?"[65]

One managerial aspect of PLPs that DiMartino and Clarke identify is the usage of technology: "Although PLPs are meant to be flexible, paper-based PLPs proved very hard to adapt. Growth in student learning generates new piles of physical documentation, punishing the most enterprising students most severely. Now, technology has begun to solve the problem with electronic PLPs and portfolios."[66] The creative usage of technology would increase the ease of implementing PLPs in a school setting. The basis of DiMartino and Clarke's suggested approach to personalized learning contains several components: differentiated instruction, backwards design, authentic instruction and assessment, and project-based assignments and assessments.[67]

Another important work in the field of personalized learning is a book edited by Joseph DiMartino, John Clarke, and Denise Wolk, entitled *Personalized Learning: Preparing High School Students to Create their Futures*, which aims to "highlight current

---

[63] DiMartino and Clarke, *Personalizing the High School Experience*, 12–32.

[64] DiMartino and Clarke, *Personalizing the High School Experience*, 36.

[65] DiMartino and Clarke, *Personalizing the High School Experience*, 41.

[66] DiMartino and Clarke, *Personalizing the High School Experience*, 57.

[67] DiMartino and Clarke, *Personalizing the High School Experience*, 74, 77, 78, 80.

initiatives that aim to personalize learning for each high school student."[68] The book is a collection of essays informing parts of the personalized learning process. In one chapter, Clarke et al. identity six categories of personalized interactions between students and teachers as best practices.[69] Understanding the identified elements of personalization grants the present research project insight into identifiable and describable elements in secondary educational settings.

The six categories of personalized interactions needed in schools are (1) recognition, (2) trust, (3) respect, (4) acceptance, (5) confirmation, and (6) relevance. *Recognition* comprises the school's intentionality of "recognizing the individual's unique contribution to school life."[70] *Trust* is characterized by several different categories, including trust between the community and students, trust between teacher and students, teacher's trusting students to lead the acquisition of knowledge, and valuing the developmental stage of students. In some instances, trust is even related to student-led interactions with money.[71] *Respect* is related to the opportunities that the educational setting gives to students so that they can gain self-respect and mutual respect among their peers.[72] *Acceptance* is defined as "deliberately fashioned community roles and processes that allow all students to become personally engaged. Through engagement in many aspects of school life, each student could gain acceptance as an identifiable member of the school community." *Confirmation* is described as students' need for "successful moments during the school day during which they could recognize and test their growing

---

[68] DiMartino, Clarke, and Wolk, eds., introduction to *Personalized Learning*, xviii.

[69] John Clarke et al., "Making Learning Personal: Educational Practices That Work," in Joseph DiMartino, John Clarke, and Denise Wolk, *Personalized Learning*, 173–94.

[70] John Clarke et al., "Making Learning Personal," 179.

[71] John Clarke et al., "Making Learning Personal," 181–83.

[72] John Clarke et al., "Making Learning Personal," 184.

individual competence in areas of the sharpening interest."[73] *Relevance*, in the sense Clarke et al. describe, deviates from the orthodox understanding perhaps related to the relevance of material to student interest. According to the authors, "Relevance in personalized school allowed each student to imagine herself engaged in an adult role, wrestling with the real and complex problems that shape human experience."[74] The six elements described in Clarke et al.'s study are also linked to the "personal relationships" experienced by students.

In his chapter in *Personalizing Learning in the 21st Century*, Derek Wise attends to the contributions of a school's organizational structure for personalized learning.[75] One particular element of a personalized school organizational structure that is of interest to the present research endeavor is connected to an alternative to traditional models of school. In traditional school settings, students are paced based on grade level and courses needed to meet graduation requirements. Wise recommends an alternative path and structure of grades to create a more personalized feel. He suggests self-contained "house systems with vertical tutor groups."[76] These *house systems* should be built around common student curriculum pathways. For example, a path through a similar interest group would align the possibility for "career schools/interest schools" that mirror the next level of education students will come into contact with post-graduation. The ability for students to choose their own pathway through school and then identify with a group of older students could add to the personalized learning experiences available to students. It would add potential to student achievement to access older students as tutors,

---

[73] John Clarke et al., "Making Learning Personal," 185.

[74] John Clarke et al., "Making Learning Personal," 187.

[75] Derek Wise, "Personalized Learning: Personalized Schooling," in *Personalizing Learning in the 21st Century*, ed. Sara de Freitas and Chris Yapp (Stafford, UK: Network Educational Press, 2005), 47–52.

[76] Wise, "Personalized Learning: Personalized Schooling," 50.

too. Unique vertical tutoring and unique school organization seems to be an important element of personalized learning.

In 2015, Allison Zmuda, Greg Curtis and Diane Ullman published a book titled *Learning Personalized: The Evolution of the Contemporary Classroom*.[77] In this important work on personalized learning, the authors cover many aspects of its implementation, suggesting and exploring twelve elements of personalized learning: (1) disciplinary outcomes, (2) cross-disciplinary outcomes, (3) mindsets, (4) task, (5) audience, (6) feedback, (7) evaluation, (8) process, (9) environment, (10) demonstration of learning, (11) time, and (12) advancement.[78]

Zmuda, Ullman, and Curtis's model of personalized learning contains several elements that when used in combination with other elements, present a unique approach to personalized learning. This model has many elements and is robust in its implementation suggestion, covering an in-class approach along with a broader cross-discipline component that is linked to preparing students for college.[79] Zmuda, Ullman, and Curtis also put a heavy emphasis on the assessment and designing of authentic feedback opportunities for students.[80] This model also features heavy student advancement based on the personal success of the student. Advancement is directly related to successful expressions of "clearly defined competencies."[81] It is similar to mastery learning.

---

[77] Allison Zmuda, Diane Ullman, and Greg Curtis, *Learning Personalized: The Evolution of the Contemporary Classroom* (San Francisco: Jossey-Bass, 2015).

[78] Zmuda, Ullman, and Curtis, *Learning Personalized*, 25, 30, 47, 60, 63, 67, 70, 110, 119, 132, 143, 145.

[79] Zmuda, Ullman, and Curtis, *Learning Personalized*, 31.

[80] Zmuda, Ullman, and Curtis, *Learning Personalized*, 63.

[81] Zmuda, Ullman, and Curtis, *Learning Personalized*, 145.

The above survey of several literary sources shows a range in the suggested models of personalized learning. Several of the models suggest elements that may or may not be entirely personalized—the inclusion of which, combined with other elements, could provide a more understandable model of personalized learning. Out of the many perspectives of personalized learning represented above, some are written for the inclusion of personalized learning in the classroom—the intended audience of which would be a teacher—while others are written toward more of a district level or administrative level of personalized learning. Moving personalized leaning out of the classroom is another aspect that needs to be considered by any seeking to implement personalized learning. All of these parts point to the need for clarification concerning the terminology, elements, and benefits of personalized learning. As much as personalized learning seems to offer, there are many concerns surrounding personalized learning—concerns that I now turn to consider.

Concerns Surrounding Personalized Learning

Garcia-Delmuro's research findings point to a few areas of concern for educational systems interested in implementing personalized learning programs. Garcia-Delmuro specifically studied the *Pinnacle Learning*, a personalized learning software, implementation. That software has a component of project-based assessment. One particular group of teachers—math teachers—struggled to implement projects for their students.[82] The concern is that project-based assessments in personalized learning may provide an imbalanced focus on abstract subjects such as literature and art. The more concrete area of mathematics may be difficult to assess in a project format.

Another finding that raises a concern is related to the implementation of mentorship-based personalized learning. Garcia-Delmuro finds that teachers value

[82] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 94.

mentorship aspects of personalized learning but have limited time to meet thoroughly with students.[83] The concern recognized is that mentoring students is a time-consuming element of personalized learning. Teachers, who are already under great pressures of club activities, sports, and maintaining regular classes, may not be able to fully attend to personalized mentoring.

Garcia-Delmuro offers a keen concern regarding low socioeconomic educational settings that seek to implement personalized educational software programs. The software programs require teachers to be well equipped to pace students appropriately, and often, schools in low socioeconomic educational settings are being left behind. The concern Garcia-Delmuro alludes to is that without appropriate implementation and training for staff, personalized learning programs cannot be but a Band-Aid on a laceration requiring sutures.[84]

Garcia-Delmuro finalizes her research with a suggestion to those seeking to donate toward personalized learning implementations: "Donors that are giving to the advancement of personalized learning need to consult new research to ensure that they are donating to programs that benefit all students, including those who belong to vulnerable populations, not just those who are able to self-direct."[85] If the intention of a system is to implement a personalized learning program that supports underserved or underperforming student populations, then research on specific successes in those areas is required. Education is already full of rewards for those who can succeed.

Another concern is student preparation for standardized tests. If teaching is personalized, how will all students be prepared for a test intended to gauge everyone with the same measurement of learning. DiMartino and Clarke have a rebuttal for this concern:

---

[83] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 101.

[84] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 131.

[85] Garcia-Delmuro, "Teacher Experience with Personalized Learning," 132.

"Exposing teachers and others to research that shows personalized teaching does not reduce test scores or college acceptance rates . . . can reduce their fear, but teachers, parents, and community members also need time to talk through their concerns and look at studies that show little cause for alarm."[86] While DiMartino and Clarke offer evidence for their support, the concerns and arguments remain serious. Teacher funding and school success is often directly contingent upon the scores received from standardized tests.

As evidence supporting the personalization of schools improving tests scores, DiMartino and Clarke point to work conducted by Linda Darling-Hammond, Jacqueline Ancess, and Susanna Wichterle Ort, who research the best options for improving secondary schools. One of the design features of their research is "that schools that had restructured to personalize education and develop collaborative learning structures produced significantly higher achievement gains and that the gains were more equitably distributed."[87] Seemingly, this information supports DiMartino's and Clarke's position that test scores can be increased by personalized learning. However, there remains the issue of student-to-teacher ratios.

Darling-Hammond, Ancess, and Ort also point to the benefits of reduced pupil load in their successful design features: "Neither caring teachers nor small school size would likely produce these outcomes if teachers still had to juggle the needs of 150 or more students each day."[88] Smaller class size allows teachers more time to interact with their students, but the overall amount of students required on a teacher's load is also important. A personalized educational setting is possible in environments where teacher

---

[86] DiMartino and Clarke, *Personalizing the High School Experience*, 99.

[87] Linda Darling-Hammond, Jacqueline Ancess, and Susanna Wichterle Ort, "Reinventing High School: Outcomes of the Coalition Campus Schools Project," *American Educational Research Journal* 39, no. 3 (January 2002): 641.

[88] Darling-Hammond, Ancess, and Ort, "Reinventing High School," 655.

workload ratios are conducive to personalization.[89] The concern is that many schools that may benefit the most from personalized learning may not be able to access it for various logistical reasons.

Another concern rises in relation to the actual choices personalized learning can contain for children. In her chapter in *Personalizing Learning in the 21st Century*, Sara de Freitas explores the relationship personalized learning could potentially have with technology. She discusses a concern—called the *choice-personalization paradox*—in connection with access to information and standards of learning set by institutions.[90] This paradox describes a student's unlimited access to information by means of the internet. The implementation of student choice would seemingly be infinite if the internet is the resource that is utilized. The internet control and filtering that has the potential to take place could be problematic for the desired outcomes. According to Freitas,

> The greater the filtering the less control the learner may have over the content delivered thereby creating a powerful paradox that may have the opposite effect than that which was originally intended. While the idea behind personalization has broadly been to provide increased choice, higher quality content and more learner control, the net impact of this approach may paradoxically be to provide less choice, lower quality content and reduced learner control.[91]

However, a student must be narrowed into some field of knowledge; therefore, the choices must be filtered. Freitas points out the control an institution has by filtering those choices: "There are problems associated with how this filtering process is mediated: what is selected and what is not selected, why is an option selected over another option,

---

[89] Adria Steinberg, Jane Milley, and Marty Liebowitz, "Community-Connected Learning: Personalization as a Vehicle for Reform," in DiMartino, Clarke, and Wolk, *Personalized Learning*, 145.

[90] Sara de Freitas, "The Paradox of Choice and Personalization," in Freitas and Yapp, *Personalizing Learning in the 21st Century*, 14.

[91] Freitas, "The Paradox of Choice and Personalization," 15.

and ultimately who controls that selection?"[92] Her suggested solution is learning content that is chosen either "by the learner or collaboratively."

A final concern for the niche of Christian education lies in allowing students to determine their own paths. It goes against traditional wisdom to consider teenagers to be capable of choosing what they like or do not like. In a presentation on personalization and technology, Audrey Watters explains the issue of media and cultural influence as seen in the personalization of products, suggesting that the popular choice of a society and personalization are directly related.[93] Popular choice and student choice are connected. This connection raises some questions: Why do students want to learn a particular area of interest? If students are influenced greatly by popular trends, then how will education based on personalized choice be influenced? Do students really know what they need?

While many of the concerns set forth above are beyond the scope of the present research endeavor, it is important to note their existence and consider their resolve. This research suggests that the isolation of personalized learning elements and their benefits would allow schools to incorporate varying models of personalized learning. That information would help schools select models that best meet their needs. Then, the additional collection and presentation of existent terminology surrounding personalized learning would further the common understanding of it. Increased understanding will hopefully lead to the implementation of personalized learning in schools with student populations that stand to gain the most from it.

Conclusion

There are gaps in the research evident in the lack of agreement on models of personalized learning. The inconsistency is shown in the absence of a commonly agreed

---

[92] Freitas, "The Paradox of Choice and Personalization," 15.

[93] Audrey Watters, "The Histories of Personalized Learning," Hack Education, June 9, 2017, http://hackeducation.com/2017/06/09/personalization.

upon definition of personalized learning and the dissimilarity between models and elements examined across various approaches of research concerning personalized learning. The information presented above raises the question “How can research continue if everyone is testing their own idea of personalized learning?” Advancement in personalized learning is hindered until advancements regarding the terminology, elements, and benefits of personalized learning are developed. In the present research undertaking, I aim to further the understanding of personalized learning through its terminology, elements, and benefits as found in recent dissertational studies. In the following chapter, I present my approach to uncovering any existent similarities in hopes to further personalized learning’s advancement.

CHAPTER 3

METHODOLOGICAL DESIGN

In chapter 1, I investigated the reasons for growing interest in personalized learning. Namely, its potential to offer a solution to Bloom's two-sigma problem and increase student achievement. I then offered the concern of loose and non-existent definitions facing those who want to implement personalized learning. I presented this research's definition of personalized learning along with a conceptual understanding of its elements and models. From there. I offered information about the possible origins of personalized learning. Then I proposed a way to research clarity on the terminology, elements and benefits of personalized learning.

In chapter 2, I pointed out the gap in the literature surrounding personalized learning, which is the inconsistent terminology found throughout models of personalized learning. I also revealed the inconsistency of personalized learning models to demonstrate clearly the benefits of their implementation. This inconsistency is due in part to a lack of clarity and consistency regarding the implementation of personalized learning models and the varying elements included in those models. These gaps suggest that an organized system of personalized learning needs to be developed, the existence of which will benefit any educational institute interested in tailoring instruction to best fit a student's need.

In this chapter, I articulate my methodology design for synthesizing the existing research in the field of personalized learning. The study outlined below is a meta-analysis of dissertations concerning personalized learning in a secondary educational setting. It utilizes content analysis software to observe and organize information from dissertations in the field. The idea for creating this research

methodology originated from reading two sources: Benjamin Bloom's *Taxonomy of Educational Objectives* and James Kulik, Chen-Lin Kulik, and Peter Cohen's "A Meta-analysis of Outcome Studies of Keller's Personalized System of Instruction."[1]

In describing how he developed *Taxonomy of Educational Objectives,* Bloom offered several insightful ideas. Along with his colleagues, Bloom states, "We grew quite enthusiastic about the possibilities of several schemes for securing, at the minimum, a common terminology for describing and referring to the human behavioral characteristics we were attempting to approach in our different school and college settings."[2] The thought process of building an ordered understanding of terminology from sources of information seems particularly relevant to the definitions, elements, and benefits of personalized learning. Bloom's approach sought the answer for building a systematic understanding of the knowledge requirements from test question's used in academic settings. The combination and description of personalized learnings terminology and benefits was related to Bloom's knowledge requirements and test questions was related in my mind. Bloom's work led me to consider the need for a usable ordered document to understanding personalized learning as it would be extremely useful for those seeking to implement it in the secondary school settings.

Kulik, Kulik, and Cohen's approach to meta-analysis was quantitative in nature.[3] The group sought to compare as many studies on Fred Keller's Personalized System of Instruction (PSI) as they could find to the traditional method of teaching college courses. Surveying multiple sources may help order the confusion surrounding

---

[1] See Benjamin S. Bloom, David R. Krathwolhl, and Bertram B. Masia, *Taxonomy of Educational Objectives: The Classification of Educational Goals*, vol. 2, *Affective Domain* (New York: David McKay, 1969); James A. Kulik, Chen-Lin C. Kulik, and Peter A. Cohen, "A Meta-Analysis of Outcome Studies of Keller's Personalized System of Instruction," *American Psychologist* 34, no. 4 (April 1979): 307–18.

[2] Bloom, Krathwolhl, and Masia, *Taxonomy of Educational Objectives,* 2:3.

[3] Kulik, Kulik, and Cohen, "A Meta-Analysis of Outcome Studies," 309.

personalized learning. While the present research initiative is qualitative in nature, the overall idea of building a population based on existing dissertational studies is similar to the methodology of Kulik, Kulik, and Cohen's research. The notion of including strong study inclusion guidelines was also a strength of Kulik, Kulik, and Cohen's work.[4]

Below, I articulate in greater detail my approach to a meta-analysis using qualitative content analysis techniques. The flow of information moves from the purpose of the research to the details of approaches to coding.

Meta-Analysis

The amount of extant studies in many fields of science can often be staggering. Researchers have developed a way to consider results from studies: *meta-analysis*. Often, the goal of meta-analysis research is to offer a synthesis of what has been done. In their book concerning meta-analysis, Mark W. Lipsey and David B. Wilson say, "Meta-analysis is now widely accepted as a method of summarizing the results of empirical studies within the behavioral, social, and health sciences."[5] The meta-analysis method has been used as a means of statistically analyzing quantitative research.[6] However, there are usages of meta-analysis in the qualitative approach to research and benefits.

While a quantitative approach to a meta-analysis may be specifically concerned with statistical comparisons, certain types of meta-synthesis exist in qualitative research. Authors George W. Noblit and R. Dwight Hare made use of a type of meta-synthesis called a *meta-ethnography*: "A meta-ethnography can be considered a complete study in itself. It compares and analyzes texts, creating new interpretations in the

---

[4] Kulik, Kulik, and Cohen, "A Meta-Analysis of Outcome Studies," 309.

[5] Mark W. Lipsey and David B. Wilson, *Practical Meta-Analysis* (Thousand Oaks, CA: Sage, 2001), 1.

[6] Lipsey and Wilson, *Practical Meta-Analysis*, 2.

process."[7] Noblit and Hare identified a meta-ethnography as a type of "systematic comparison" that "involves the translation of studies into each other."[8] While Noblit and Hare are mainly concerned with a meta-ethnography, their suggestions in the process provide helpful insight for the present research endeavor's process.

Noblit and Hare suggest seven phases toward the creation of a meta-synthesis.[9] Phase 1 is the identification of "something that is worthy of the synthesis effort." Phase 2 is the process of deciding what studies to include and the justification for them. Relevancy to the goal of the research seems key at this phase of a meta-synthesis. Phase 3 is simply the reading of the included studies. At this point, the identification of points relevant to the research concern are identified. Phase 4 is the tracking of commonalities in the included research. The goal of phase 4 is to identify in context any themes in the different studies. Phase 5 then works to *translate* those findings in order to compare similar observed texts. Phase 6 combines the translated information into a *synthesis*. Phase 7 is the expression of the synthesized translations in a manner best suited for the material. That expression could be in the form of a written text, auditory expression, or visual expression.

There are also benefits of meta-synthesis in the qualitative field. Heidi M. Levitt describes two benefits of meta-synthesis in her work on the subject. First, "findings from a study can help researchers to identify the central change processes related to the resolution of types of therapy events across primary studies."[10] The benefit comes in the comparison of a singular finding to primary works connected with a topic.

---

[7] George W. Noblit and R. Dwight Hare, *Meta-Ethnography: Synthesizing Qualitative Studies*, Qualitative Research Methods 11 (Thousand Oaks, CA: Sage, 1988), 9.

[8] Noblit and Hare, *Meta-Ethnography*, 26.

[9] Noblit and Hare, *Meta-Ethnography*, 27–29.

[10] Heidi M. Levitt, "How to Conduct a Qualitative Meta-Analysis: Tailoring Methods to Enhance Methodological Integrity," *Psychotherapy Research* 28, no. 3 (May 2018): 375.

The result would be a well-supported comparison of new to old. The second benefit Levitt offers is the possible "development of typologies that can help identify the internal processes that are unfolding within a session." The result of such typologies offered Levitt more support concerning the trends presented in Levitt's research.

In the present research project, the usage of meta-analysis is also focused on the identification of information across a focused area of literature: dissertations concerning personalized learning. Since this study uses qualitative content analysis to order findings isolated across the meta-data, it is considered a type of qualitative meta-analysis.

Purpose Statement

The goal of this study is to further the understanding of the terminology, elements, and benefits of personalized learning. The resulting collection of data could hold valuable insight into which elements of personalized learning could be used to best benefit areas of growth. For the Christian school, the purpose of this research is to identify an evidence-based order for the possible benefits and elements of implementing a personalized learning.

Research Questions

1. Are there any identifiable commonalities in terminology regarding personalized learning in these studies?
2. What elements and benefits of personalized learning emerge from the collected dissertational studies?
3. What does an analysis of personalized learning implementations in the secular school systems offer Christian education?

Research Design Overview

The research follows a qualitative content analysis approach as a means of studying a wide array of dissertations in the theme of personalized learning. The general cycle of research identified by Paul D. Leedy and Jeanne Ellis Ormrod is as follows:

identify the problem, create goals, make subproblems, identify hypothesis and assumptions, make a plan, collect data, and then interpret that data.[11] This research generally follows Leedy and Ormrod's suggested research cycle.

Below is the research problem along with a more detail of the approach this research takes concerning data collection methods and tools. This research gathers a population comprised of dissertations published on the topic of personalized learning. Next, the dissertations are coded and analyzed utilizing *NVivo 12* queries. Then, the queries show comparisons between coded data across the dissertations included in the study.

Research Problem

No consensus has emerged regarding the benefits of implementing different elements of personalized learning. Common language and terminologies surrounding personalized learning elements vary between authors. As shown in chapter 2, many authors incorporate various levels of personalization and other teaching strategies that are not necessarily identifiable only to personalized learning, making their suggestions muddled in theory and unclear benefits. There is, therefore, a need to isolate the terminology, elements, benefits of personalized learning, and there needs to be added clarity to the current state of research on personalized learning. The identification of the benefits of personalized learning elements could lend help to any educational system looking to increase particular aspects of their school and could grant insight to the Christian education system interested in offering a more personalized approach.

[11] Paul D. Leedy and Jeanne Ellis Ormrod, *Practical Research Planning and Design*, 11th ed. (New York: Pearson, 2016), 3.

Delimitations

Studies of personalized learning built on a specific technology platform, whether that be software or hardware, are not included in this research; however, the inclusion of personalized learning studies that contain the element of technology usage are included. The focus of this research is on secondary schools; therefore, studies involving other grades (i.e., elementary and collegiate) are excluded. Studies focusing solely on virtual schools, because of their software and student motivations dependencies, are not included in this study. While there are many excellent ongoing studies concerning personalized learning in the post-graduate sector, this study narrows its focus by excluding non-dissertational studies regarding the subject of personalized learning. If two studies are identified that contain the same population and a different method of inquiry, then both studies are incorporated into the meta-analysis. If two studies use the same population and similar methods of analysis, the latter of the two is included.

This research is limited to secondary schools in grades 9–12. Information gathered is generalizable to schools in that grade range. Much of the information gathered is from the research on public and private (charter) secular schools. The populations are not generalizable to independent Christian schools. However, this research seeks to make informational data of use to the private Christian educational institution investigating personalized learning.

This research focuses on dissertations specifically connected to personalized learning written in the last ten years as accessible through the ProQuest Dissertation and Thesis database. The study inclusion guidelines are as follows: (1) must be doctoral-level dissertations focused on grades 9–12; (2) must not contain major methodological errors; (3) must be studies of schools located in the United States; (4) must use the terms related to personalized learning in the description, title, or abstract; and (5) must be a public, private, or charter school.

Research Method and Instrumentation

The research method selected is a qualitative content analysis method. It utilizes the *NVivo 12* software from QSR International. The population is constrained to dissertations from the ProQuest Dissertation and Thesis database.

Search Queries in ProQuest

The following combinations of searches are used to gather dissertations relevant for this meta-analysis. With the search parameters *dissertation only* enabled,[12] the key phrases *personalized learning, personalized education,* and *personalized* are used. The searches are then narrowed to education-related content. The results are further narrowed by grades 9–12. At this point, the researcher verifies that each study meets the requirements for inclusion by reading the abstract. If acceptance to the study cannot be determined through these two, the researcher verifies by reading further into the content of the study. In the end, the final list of dissertations is recorded along with the rationale of inclusion in the study.

Processing of Data

Upon determining the inclusion of a dissertation in the research population, the text is added to *NVivo 12*. The dissertations are named according to their title and author. When the studies included are exhausted, the coding of the studies begins. Each unit is labeled, sorted, and saved for inclusion in the study. *NVivo 12* is also utilized for this process. After the population and relevant studies have been defined, the coding process begins.

[12] The selection of dissertation only includes EdD dissertations in the ProQuest search. The research will include theses.

Coding Criteria

Klaus Krippendorff writes, "The simplest theory of meaning . . . derives from taxonomy, the idea that texts can be represented on different levels of abstraction, that there are core meanings and insignificant variations of these cores, or that important meanings are thinly distributed in a body of text and need to be identified and extracted."[13] The goal of coding in this research is to identify and extract the core meanings from relevant research surrounding personalized learning. This research follows a directed content analysis approach.

Shannon Hsieh and Sarah Shannon describe directed content analysis as a deductive approach using existing theory to guide the content analysis of a phenomenon.[14] The process, the authors suggest, is to do an initial reading, coding all accounts of the text to a pre-existing category. Then, Hsieh and Shannon suggest that one re-reads and marks uncoded text into another subcategory or new category as needed.[15] The present research initiative follows a similar coding scheme to that which Hsieh and Shannon propose. The process begins with a reading and coding of the terminology, elements, and benefits of personalized learning.

As they are all doctoral-level research projects, the studies themselves identify what is used in this research as personalized learning elements. Pre-determining all categories of elements of personalized learning may result in a hindered exposure of hidden subcategories existent in the population sample. Therefore, this research follows an initial coding scheme. The initial coding markers used in this study are the general categories of the terminology, elements, and benefits of personalized learning. However, because of the need to explore and describe personalized learning, there is the need for

---

[13] Klaus Krippendorff, *Content Analysis: An Introduction to Its Methodology*, 2nd ed. (Thousand Oaks, CA: Sage, 2004), 283.

[14] Hsiu-Fang Hsieh and Sarah E. Shannon, "Three Approaches to Qualitative Content Analysis," *Qualitative Health Research* 15, no. 9 (November 2005): 1281.

[15] Hsieh and Shannon, "Three Approaches to Qualitative Content Analysis," 1283.

the addition of new categories or subcategories while the content analysis is occurring. For example, in many dissertations, there are recorded external definitions of personalized learning that do not originate with the dissertation authors. Such definitions require a different subcategory under the main category of terminology. The need for subcategories could potentially grow as data is coded in each of the dissertations. As they grow, their ranking and frequency are recorded.

Types of Queries Used

NVivo 12 for Plus currently offers four query options for qualitatively analyzing data: (1) word frequency, (2) coding combination query, (3) matrix coding, and (4) crosstab query. This research utilizes each tool to measure multiple analyses of data gathered.

Ethics Committee Process

The ethics committee is consulted for approval of this research undertaking.

Research Procedures

This research project begins with a queried search in the ProQuest Dissertation and Thesis database for dissertations matching the criteria of dissertations concerning personalized learning. This list is then narrowed by the research inclusion guidelines. When a complete list of dissertations meeting the inclusion guidelines is generated, then the second step begins. The dissertations are gathered in a compatible software form for *NVivo 12*. At this point, a word frequency query is collected and recorded. Then, coding takes place for each dissertation. The coding is categorized in three main sections: terminology of personalized learning, elements of personalized learning, and benefits of personalized learning. Each main category of coding then includes the addition of subcategories as data is processed. After each dissertation is coded, then the queries (i.e., coding combination query, matrix coding, and crosstab query) are utilized to compare

data collected across the dissertations. Also, basic descriptive statistics and graphical analysis will be utilized to describe the emerging data from the overall study. A regression analysis will also be employed to identify any correlations between the emergent terminology, elements, and benefits identified in the content analysis.

The data collected is then employed to answer research questions 1–2: Are there any identifiable commonalities in terminology regarding personalized learning in these studies? What elements and benefits of personalized learning emerge from the collected dissertational studies? After these questions are answered, the data collected is synthesized to answer research question 3: What does an analysis of personalized learning implementations in the secular school system offer Christian education? The answers to the research questions are presented in chapters 4 and 5.

CHAPTER 4

ANALYSIS OF FINDINGS

The purpose of this research was to order the information surrounding personalized learning in its elements, benefits, and terminology. Personalized learning, a popular educational phenomenon, has few agreed upon terms. This research was designed to produce further understanding of this phenomenon in education through a content analysis of a decade's worth of dissertations related to the topic of personalized learning. The research questions for this study were as follows:

1. Are there any identifiable commonalities in terminology regarding personalized learning in these studies?
2. What elements and benefits of personalized learning emerge from the collected dissertational studies?
3. What does an analysis of personalized learning implementations in the secular school systems offer Christian education?

In this chapter, I present the procedures and results of the analysis used to answer the research questions above. I begin with the process of choosing the population; then, I discuss the details of coding; lastly, I explain the resulting elements, benefits, and terminology that emerged from the research.

Research Procedures

In this section, I describe the procedures I followed to complete the coding process of the research. The procedures began with the broad collection of any seemingly eligible dissertation, and then I thinned those into specifically qualifying dissertations. This process resulted in the population used in the study. In the following subsections, I

describe the coding procedures and coding categories, and I discuss the results organized by research questions.

Collection of Qualifying Dissertations

The dissertation collection originated in the ProQuest Dissertation Database. The search parameters were set to find dissertations (EdD and PhD) that contained *personalized learning* in the title, abstract, or key words list from the years 2009–2019. The search resulted in 180 dissertations related to *personalized learning*. The population was then narrowed to dissertations pertaining to personalized learning in secondary school settings (grades 9–12) within the United States and pertaining to students. This criterion also included secondary schools in charter, private, and public school settings. There was a resulting total of 26 dissertations that met the inclusion guidelines for this research. These dissertations were then imported into the *NVivo 12* software as searchable portable document files (.pdf). The list of dissertations included in the population can be found in appendix 1. After the import of the documents into *NVivo 12*, the coding procedures were implemented.

Coding Procedures

At the start of the process, I conducted a word-frequency query, which produced a list of most frequently used words across all the dissertations (see appendix 4). Then, I chose the most pertinent word to this research from the list to begin the process of coding: *personalized*. Using the term *personalized*, I conducted a word-search query, and the results were then saved into a code that could be highlighted and easily identified. The word search query for *personalized* also included all of the stem forms of the word *personalized* (i.e., *personal*) so as not to miss any opportunity.[1] The ability to

[1] In some dissertations, an abbreviation for personalized learning was used, like PL. I created a new text search query for these cases and then followed the same procedures listed above: highlighted,

highlight the saved code ensured a visual reference point to all usages of the term *personalized* in the dissertation population, thereby further minimizing coding errors and unintentional bias.

Coding categories. As mentioned in chapter 3, the predetermined coding categories for the research were elements, benefits, and terminology relating to personalized learning. This study allows the adding of more categories as needed as a means to uncover any other possible categories that were evident in the research. The need for this would be determined from the population itself. While three categories were created before the coding process, four main categories emerged when combing through each instance of *personalized*. The research resulted in the main categories labeled *Benefits of Personalized Learning, Elements of Personalized Learning, Definitions of Personalized Learning,* and *Challenges of Personalized Learning*. Each category also developed subcategories as needed.

Coding in context. Next, the research design called for each term to be marked and moved into newly created subcategories. To determine placement in the appropriate group, the codes were highlighted (using the feature in *NVivo* "highlight selected codes"). Then, each usage of *personalized* was read in context and placed in categories that best fit the meaning of the sentence. The context included the immediate surroundings of the usage of *personalized*. After reading the context, the code would be selected and dragged and dropped into the subcategory most appropriate for its meaning, or they were left uncoded if they contained no information relevant to the research. If a code had no previously created subcategory into which best fit, then a new subcategory was created. The usages of elements, benefits, and terminology around the word were

---

coded in context, and created new coding categories as needed. There were only a few dissertations that needed this variance in procedures, but doing so further insured reliability in the test.

also coded if those usages identified aspects of personalized learning relevant to this research. This process was continued for all usages of *personalized* throughout the dissertations in the population.

Research Results

The current disarray of personalized learning highlighted in chapter 2 indicated the need for more research. The goal of this research was to provide insight to any commonalities in terminology and highlight emergent benefits and elements of personalized learning in order to make it more useful to any who would implement its practices, especially those of Christian education. This goal was accomplished through a meta-scale content analysis on 26 dissertations from the last ten years. The research utilized coding procedures that resulted in large amounts of data. The data generated from coding was organized and then analyzed for common terminology, frequency, and prevalence.

The frequency and prevalence statistics were incorporated successfully and postulated answers for research question 2. The results yielded for research question 2 also provided answers for research question 1. The frequency and prevalence analysis of the data provided a list of commonly used terminology concerning elements and benefits of personalized learning. The following section provides answers to both research questions 1 and 2.

Research Question 1: Commonalities in Terminology of Personalized Learning

The first research question (*Are there any identifiable commonalities in terminology regarding personalized learning in these studies?*) was answered in a few methods of analysis. The process of answering this question started with identifying the definitions, or information related to the definitions, regarding personalized learning. That information was then coded into its unique category. Next, a word frequency test

was performed on the coded information related to definitions. Then, the common terminology surrounding the elements and benefits prevalence for research question 2 was extrapolated to show more commonly identifiable terms in the research. Finally, a matrix coding query was used to identify co-occurrences of coded benefits and elements of personalized learning. The following section contains the results of tests related to research question 1 and its common terminology.

Commonalities Identified in Terminology Associated with the Definitions of Personalized Learning

First, the information regarding definitions of personalized learning was coded and categorized separately from the other categories. The definitions were then analyzed for any common definitions; there were only similarities present. Next, the information coded under the definitions was analyzed for word frequency usage. This query produced a list of most used words in a definition of personalized learning.

In the 26 dissertations included in this research, 17 contained definitions of personalized learning. There were 48 statements concerning a definition of personalized learning identified and coded. Some statements varied in clarity, and some highlighted various parts of personalized learning. While many common terms emerged within the codes, no common definition was identified. However, a word frequency test was conducted to identify the most frequently used words in the coded definitions. The frequency of words used concerning definitions allows insight into the definitions of personalized learning. See table 1 for a list of the most frequently used words within the codes concerning definitions of personalized learning. A visualization using a word cloud was also created. See figure A1 (in appendix 5) for a word cloud visualization containing with the most commonly used words from data coded relating to definitions of personalized learning.

Table 1. Words most frequently used in identified definition of personalized learning

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
learning	8	116	8.11	learn, learning
students’	9	72	5.03	student, students, students’
personalized	12	65	4.54	personal, personalization, personalized, personalizing
instruction	11	35	2.45	instruction, instructional
needs	5	25	1.75	need, needs
interests	9	23	1.61	interest, interests
educators	9	21	1.47	educating, education, educational, educators
tailoring	9	19	1.33	tailor, tailored, tailoring
individual	10	18	1.26	individual, individualization, individualizing, individually
learners	8	17	1.19	learner, learners, learners’
approach	8	15	1.05	approach, approaches
environment	11	14	0.98	environment, environments
based	5	12	0.84	based
teachers	8	12	0.84	teacher, teachers
defined	7	11	0.77	define, defined, defines, defining
designed	8	11	0.77	design, designed, designing, designs
flexible	8	11	0.77	flexibility, flexible
school	6	11	0.77	school, schools
experiences	11	10	0.70	experience, experiences
model	5	10	0.70	model, models
plan	4	10	0.70	plan, plans
process	7	10	0.70	process

Table 1 Continued

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
support	7	10	0.70	support, supports
centered	8	8	0.56	center, centered
goals	5	8	0.56	goals
ownership	9	8	0.56	ownership
technology	10	8	0.56	technology
content	7	7	0.49	content
provide	7	7	0.49	provide, providing
systems	7	7	0.49	system, systems

The test yielded positive results on the identifiable commonalities in terminology concerning personalized learning. The definitions are likely to include the words the following words: *learning, students', personalized, instruction, needs, interests, educators, tailoring, individual, learners, approach, environment, based, teachers, defined, designed, flexible, school, experiences, model, plan, process, support, centered, goals, ownership, technology, content, provide,* and *systems*. The results suggest the possibility of creating a commonly referred to definition of personalized learning. The next way I contend to answer research question 1 is through looking at the data gathered from the frequency and prevalence tests.

Terminology Emerged in the Coding Process of Benefits and Elements of Personalized Learning

The second part of answering research question 1 is found in the data resulting from the frequency and prevalence tests. As stated earlier in this chapter, all accounts of *personalized* were identified, then the appropriate context was analyzed for a contextual coding of personalized learning. A comprehensive list of common terminology surrounding the elements and benefits of personalized learning was discovered from this process.

The results from the coding process were a total of 212 unique subcategories under the main categories *Elements and Benefits*. Out of the total, 48 were identified in *Benefits* of personalized learning, and 164 in *Elements* of personalized learning. Of these results, 39 elements emerged as the most frequently referenced.[2] Two *Elements* in these 39 categories were identified in seven or more dissertations in the population, while only seven *Benefits* of personalized learning were identified in seven or more dissertations.

The most prevalent categories of *Elements* and *Benefits* is further explored in response to research question 2 below. For this subsection, the data was analyzed in relation to the terminology and the common terms identified. This process resulted in a list of most referred to terms associated with the elements and benefits of personalized learning in accordance with the measure of finding better terminology for personalized learning. The following subsection describes the commonly identified terms associated with, first, *Benefits* and, second, *Elements*.

Common terminology associated with benefits. I found that 48 subcategories concerning benefits of personalized learning emerged in the population. These results also yielded emergent common terminology used to reference the benefits. The common terms identified were as follows: *Academic Achievement; At Risk, Underserved, or High Needs Students; Increase in Positive Perception of Education; Increased Student Engagement; School Reform; Serves All Students; and Student Motivation*. These terms were found used in more than seven dissertations in the population. See table 2 for an alphabetical list of common terminology surrounding the benefits of personalized learning. Appendix 3 contains a complete list of emergent benefits in commonalities sorted by prevalence. The list of seven terms above identifies a common usage in terminology among researchers when referring to the benefits of personalized learning. I

[2] The most frequent is defined in this research as a reference existing in at least 7 out of 26 (~25 percent) dissertations.

further explain the implications of these results in chapter 5. The ensuing subsection contains a list of commonly referred to terms concerning *Elements* of personalized learning.

Table 2. Alphabetical list of common terminology surrounding the benefits of personalized learning

Academic Achievement
At Risk, Underserved, or High Needs Students (for)
Increase in Positive Perception of Education
Increased Student Engagement
School Reform
Serves All Students
Student Motivation

Common terminology associated with elements. The coding process also yielded 164 elements of personalized learning. These categories reference a commonality of terms connected to the elements of personalized learning. Of the 164 categories of elements, 39 contained common references found across seven or more dissertations in the population (n=26). See table 3 for an alphabetical list of most commonly referred to terms connected with elements of personalized learning. The most common terms concerning the *Elements* of personalized learning were as follows: *Student Need, Student Centered, Technology, Flexible Learning Settings or Environment, Leaving of Traditional Teaching Methods or Models, Student Interest Based Studies, Career Minded or Beyond Classroom Focus, Teacher Role, Student Choice, Individual Learning Plan or Personal Learning Paths, Student Directed Learning (Self-Directed or Student Driven), Mastery Based or Competency Based, Teacher Development, Teacher Student Relationships, Student Led Pacing or Personalized Pacing, Learning Styles or Modalities, Blended Learning, Stakeholder's Involvement and Relationship, Community Involvement or Engagement, Collaboration Between Students, Student Academic Goals,*

Project Based, Utilizing Data, Socio-Emotional Support, Student Ability Based, Student Self-Regulation, Lower Teacher to Student Ratios, Personalized Assessment, Personalized Curriculum, Personalized Interventions, Multiple Types of Instruction, Teacher and Student Collaboration or Conferences, Student Engagement, Student Profiles, Individual Feedback, Based on State Standards and Set Curriculum, and *Student Ownership or Agency*.

Table 3. Terminology concerning elements of personalized learning

Terms	
Based on State Standards and Set Curriculum	Student Ability Based
Blended Learning	Student Academic Goals
Career Minded or Beyond Classroom Focus	Student Centered
Collaboration Between Students	Student Choice
Community Involvement or Engagement	Student Directed Learning, Self-Directed, or Student Driven
Flexible Learning Settings or Environment	Student Engagement
Individual Feedback	Student Interest Based Studies
Individual Learning Plan or Personal Learning Paths	Student Led Pacing or Personalized Pacing
Learning Styles or Modalities	Student Need
Leaving of Traditional Teaching Methods or Models	Student Ownership or Agency
Lower Teacher to Student Ratio	Student Profiles
Mastery Based or Competency Based	Student Self-Regulation
Multiple Types of Instruction	Teacher and Student Collaboration or Conferences
Personalized Assessment	Teacher Development
Personalized Curriculum	Teacher Role
Personalized Interventions	Teacher Student Relationships
Project Based	Technology
Socio-Emotional Support	Technology
Stakeholder's Involvement and Relationship	

The 39 terms above demonstrated the most commonly referred to terms concerning the *Elements* of personalized learning. The answer to research question 1 is in part found in these 39 terms. These terms show that authors most commonly refer to these terms when referencing the innerworkings of personalized learning. These results can offer insight to any educator seeking to create a model of personalized learning. More about this is presented in chapter 5. Next, I discuss the results of a matrix coding query and its common terminology used in the population.

Matrix Coding Query

Third, a matrix coding query was utilized to identify any references that *Benefits* and *Elements* had in common. The coding query answers the question *When an element was referenced in a dissertation, was a benefit also referenced?* The coding procedures allowed for co-occurrences to be measured. These co-occurrences show commonly used terms of *Benefits* with commonly used terms of *Elements*.

A matrix coding query available within the *NVivo 12* software was utilized to identify these co-occurrences. A total of 164 *Elements* were compared to a total of 48 *Benefits* of personalized learning. The query revealed very few co-occurrences between the categories *Benefits* and *Elements*.

The top co-occurrence was between the benefit *Academic Achievement* and the element *Technology* (six co-occurrences in the population). *Student Motivation* and *Student Competence* co-occurred five times. *Student Motivation* and *Student Need* co-occurred four times. *Student Motivation* and *Student Relatedness* also co-occurred four times. *Academic Achievement* and *Technology* co-occurred four times. *Student Motivation* and *Technology* co-occurred three times. *Improved Well-Being* and *Student Autonomy* co-occurred three times. *Improved Well-Being* and *Student Competence* co-occurred three times. *Serves All Students* and *Blended* co-occurred three times. *Used for Remediation* and *Technology* co-occurred two times. *Student Motivation* and *Student*

Choice co-occurred two times. *Student Motivation* and *Student Interest Based* co-occurred two times. *Non-Cognitive Skills* and *Flexible Learning Settings or Environments* co-occurred two times. *Increased Student Engagement* and *Student Centered* co-occurred two times. *Improved Well-Being* and *Student Need* co-occurred two times. *Improved Well-Being* and *Student Relatedness* co-occurred two times. *Decreased Academic Dysfunction* and *Individual Learning Plan or Personal Learning Path* co-occurred two times. *At Risk, Underserved, or High Needs Students* and *Student Centered* co-occurred two times. *Equity* and *Student Centered* co-occurred two times. *Academic Achievement* and *Student Centered* also co-occurred two times. Figure 2 is a visual representation of the co-occurrences numbering between two and six.

The matrix coding query offers insight into overlaps between *Benefits* and *Elements*. It is related to commonly used terminology because it shows only what *Elements* and *Benefits* overlapped in code. Identifying these overlaps further the understanding of commonalities in terminology and shows a type of relationship. The matrix coding query provides insight into an author's understanding of the relationship between the two terms.

In conclusion, research question 1 was answered in this research through three ways. First, the coding and analysis of definitions relating to personalized learning and their frequency. This yielded a list of commonly used terms associated with the definition of personalized learning. Second, through an alternative interpretation of the data collected for research question 2, the results of the coding of *Benefits* and *Elements* of personalized learning offered a list of common terms used to describe these aspects of personalized learning. Third, the matrix coding query offered a list of co-occurrences of the *Benefits* and *Elements* of personalized learning. The results offer insight into how authors view the relationship between the commonly identified terms. The implications

of these findings are further analyzed in chapter 5 of this research. The next section offers answers to research question 2.

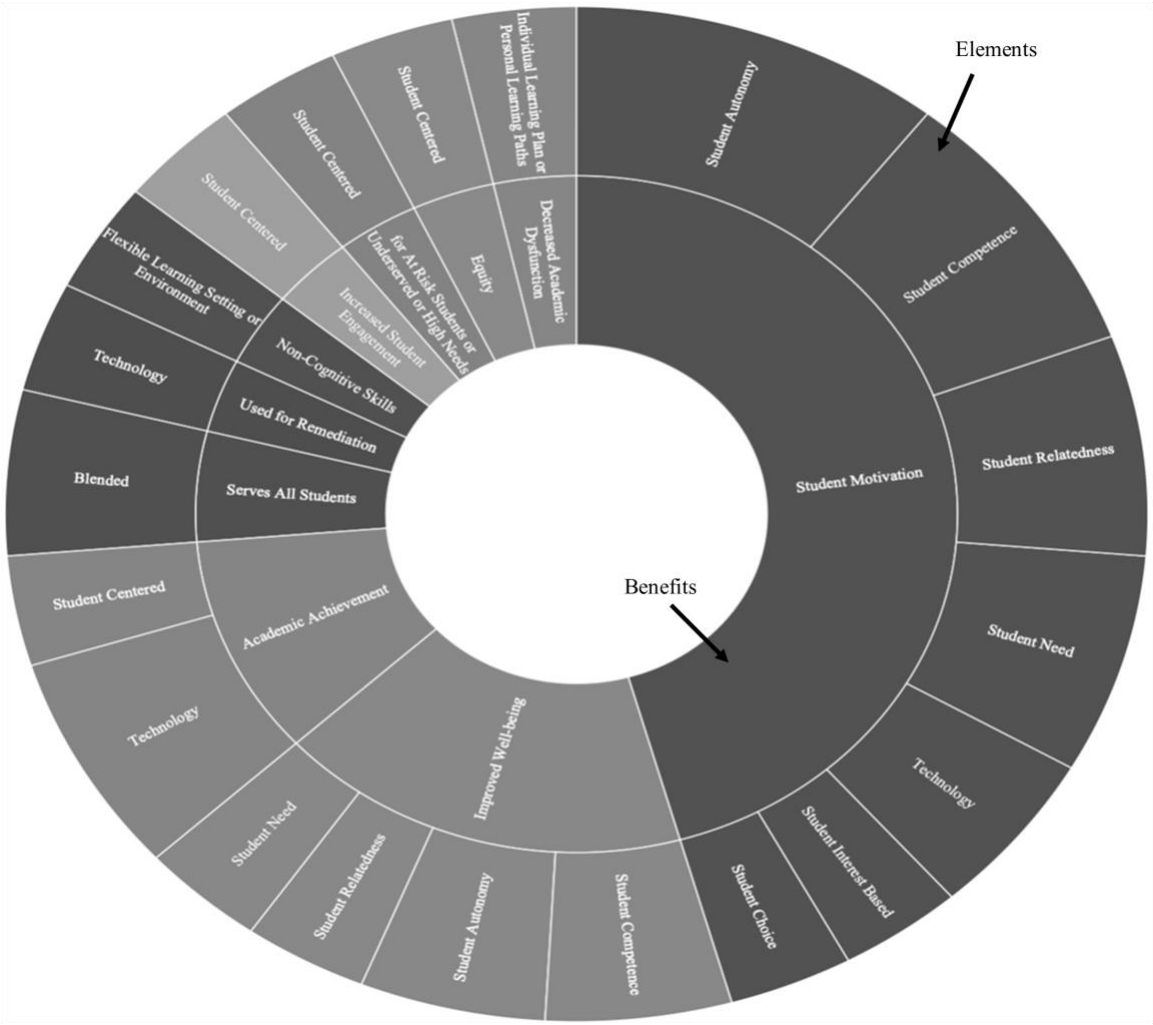

Figure 1. Visualization of matrix coding query results

Research Question 2: Emergent Benefits and Elements of Personalized Learning

The second research question (*What elements and benefits of personalized learning emerge from the collected dissertational studies?*) was answered through the coding process and implementation of descriptive statistics. The references to

personalized learning associated with *Benefits* and *Elements* were identified and then analyzed using descriptive (frequency and percentage) statistics with the purpose of generating a measure of prevalence across the population. The resulting data yielded a prevalence rate of the emerged *Benefits* and *Elements* subcategories. This prevalence rate shows the most frequent *Benefits* and *Elements* of personalized learning, thus answering research question 2. The following subsections contain the results of the coding process and descriptive statistical tests and their yields. In the subsections below, the emerged *Benefits* are identified and described, and then the *Elements* are identified and described.

Benefits of Personalized Learning

The post-coding emergent data resulted in 42 distinct *Benefits* identified. For a complete list of all coded benefits of personalized learning, see appendix 3. Of those 42 *Benefits* coded, 9 emerged as most prevalent. The top emergent categories were determined by using frequency statistics. Each variable was measured to determine its rate of frequency across the 26 dissertations. The results yielded that the most prevalent *Benefits* of personalized learning were found to exist in approximately 25 percent or more at the rate of seven mentions across the population of 26 dissertations. The next subsection shows a list of the top *Benefits* identified in this research. See table 4 for a chart of the top *Benefits* of personalized learning.

Table 4. Top benefits of personalized learning

Benefits of Personalized Learning	Number of Dissertations with References	Total Number of References	Frequency	Percent (%)	Valid Percent (%)
Academic Achievement	199	61	20	76.90	76.90
Serves All Students	15	42	15	57.70	57.70

Table 4 Continued

Benefits of Personalized Learning	Number of Dissertations with References	Total Number of References	Frequency	Percent (%)	Valid Percent (%)
Increased Student Engagement	13	26	13	50.00	50.00
For at Risk, Underserved, or High Needs Students	12	48	12	46.20	46.20
School Reform	12	47	12	46.20	46.20
Student Motivation	12	42	12	46.20	46.20
Increase in Positive Perception of Education	7	20	7	26.90	26.90

The *Benefits* of personalized learning that emerged in seven or more dissertations concerning personalized learning in secondary settings in the past ten years were as follows: *Academic Achievement; Serves All Students; Increased Student Engagement; For at Risk, Underserved, or High Needs Students; School Reform; Student Motivation;* and *Increase in Positive Perception of Education*. Below are the statistical data of each benefit that emerged in this research.

Academic Achievement was the most prevalent benefit in the dissertations. Out of 26 dissertations, 19 contained references to this benefit, yielding a 76.9 percent prevalence. The total number of references was 61.

Serves All Students was the second most prevalent benefit. Out of 26 dissertations, 15 contained references to this benefit, yielding a 57.7 percent prevalence. The total number of references was 42.

Increased Student Engagement was the third most prevalent benefit. Out of 26 dissertations, 13 contained references to this benefit, yielding a 50 percent prevalence. The total number of references was 26.

For at Risk, Underserved, or High Needs Students was the fourth most prevalent benefit. Out of 26 dissertations, 12 contained references to this benefit, yielding a 42.3 percent prevalence. The total number of references was 48.

School Reform was the fifth most prevalent benefit. Out of 26 dissertations, 12 contained references to this benefit, yielding a 42.3 percent prevalence. The total number of references was 47.

Student Motivation was the sixth most prevalent benefit. Out of 26 dissertations, 12 contained references to this benefit, yielding a 42.3 percent prevalence. The total number of references was 42.

Increase in Positive Perception of Education was the seventh most prevalent benefit. Out of 26 dissertations, 7 contained references to this benefit, yielding a 26.9 percent prevalence. The total number of references was 20.

The information above is part of the answer to research question 2. The results describe the emerged *Benefits*. Those results, along with descriptive statistics, identified the most prevalent *Benefits* referenced in the population. The implications of this answer are further explored in chapter 5. The next subsection contains the data for the second part of research question 2; the emergent *Elements* identified in this research are found below.

Elements of Personalized Learning

The coding process applied to the 26 dissertations found in the population identified 164 unique elements of personalized learning.[3] After the identification of these

[3] For a complete list of emerged elements of personalized learning and their prevalence across the population, see appendix 3.

elements, descriptive statistics were applied to the data. Out of the 164 elements identified, there were 37 elements of personalized learning referred to in seven or more dissertations in the population. See table 5 for a list of the top elements of personalized learning. Those 37 *Elements* of personalized learning are the most prevalent *Elements* of personalized learning. The next section lists and describes the *Elements* statistically.

Table 5. Top elements of personalized learning

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References	Frequency	Percent (%)	Valid Percent (%)
Student Need	20	113	20	76.9	76.9
Student Centered	20	139	20	76.9	76.9
Technology	19	414	19	73.1	73.1
Flexible Learning Settings or Environment	18	131	18	69.2	69.2
Leaving of Traditional Teaching Methods or Models	18	40	18	69.2	69.2
Student Interest Based Studies	17	116	17	65.4	65.4
Career Minded or Beyond Classroom Focus	17	116	17	65.4	65.4
Teacher Role	16	80	16	61.5	61.5
Student Choice	16	69	16	61.5	61.5
Individual Learning Plan or Personal Learning Paths	16	290	16	61.5	61.5
Student Directed Learning, Self-Directed, or Student Driven	16	82	16	61.5	61.5
Mastery Based or Competency Based	15	160	15	57.7	57.7
Teacher Development	15	106	15	57.7	57.7
Teacher Student Relationships	15	82	15	57.7	57.7
Student Led Pacing or Personalized Pacing	14	81	14	53.8	53.8

Table 5 Continued

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References	Frequency	Percent (%)	Valid Percent (%)
Learning Styles or Modalities	14	36	14	53.8	53.8
Blended Learning	12	173	12	46.2	46.2
Stakeholder's Involvement and Relationship	12	39	12	46.2	46.2
Community Involvement or Engagement	12	34	12	46.2	46.2
Collaboration Between Students	11	28	11	42.3	42.3
Student Academic Goals	11	24	11	42.3	42.3
Project Based	11	48	11	42.3	42.3
Utilizing Data	10	70	10	38.5	38.5
Socio-Emotional Support	10	20	10	38.5	38.5
Student Ability Based	9	19	9	34.6	34.6
Student Self-Regulation	9	21	9	34.6	34.6
Lower Teacher to Student Ratios	8	13	8	30.8	30.8
Personalized Assessment	8	14	8	30.8	30.8
Personalized Curriculum	8	14	8	30.8	30.8
Personalized Interventions	8	12	8	30.8	30.8
Multiple Types of Instruction	8	15	8	30.8	30.8
Teacher and Student Conferences	8	17	8	30.8	30.8
Student Engagement	8	21	8	30.8	30.8
Student Profiles	7	16	7	26.9	26.9
Individual Feedback	7	12	7	26.9	26.9
Based on State Standards and Set Curriculum	7	19	7	26.9	26.9
Student Ownership or Agency	7	26	7	26.9	26.9

The most prevalent elements identified in this research were as follows:

Student Need, Student Centered, Technology, Flexible Learning Settings or Environment,

Leaving of Traditional Teaching Methods or Models, Student Interest Based Studies, Career Minded or Beyond Classroom Focus, Teacher Role, Student Choice, Individual Learning Plan or Personal Learning Paths, Student Directed Learning (Self-Directed or Student Driven), Mastery Based or Competency Based, Teacher Development, Teacher Student Relationships, Student Led Pacing or Personalized Pacing, Learning Styles or Modalities, Blended Learning, Stakeholder's Involvement and Relationship, Community Involvement or Engagement, Collaboration Between Students, Student Academic Goals, Project Based, Utilizing Data, Socio-Emotional Support, Student Ability Based, Student Self-Regulation, Lower Teacher to Student Ratios, Personalized Assessment, Personalized Curriculum, Personalized Interventions, Multiple Types of Instruction, Teacher and Student Collaboration or Conferences, Student Engagement, Student Profiles, Individual Feedback, Based on State Standards and Set Curriculum, and *Student Ownership or Agency*. Next, these *Elements* are described statistically.

The entire list of *Elements* contained 164 coded categories from the 26 dissertations in the population. Of those elements, 37 were referred to in more than seven dissertations. Statistically, the term used in seven or more dissertations yielded a referral percentage of 26 percent. The terms highlighted in the 37 emergent elements demonstrate a common understanding of terms concerning the elements.

The top two terms were *Student Need* and *Student Centered*. These two terms were used in 76.9 percent (20 out of 26) of the population. This result is accurate when considering that the nature of personalized learning is rooted in a constructivist philosophy of education. The next most commonly coded reference to elements of personalized learning is *Technology*.

Technology was the third ranking term used often in the population. Out of the dissertations, 73.1 percent contained codes referencing technology's usage and roles in personalized learning. However, this subcategory, *technology*, had the most references

within the population at 414 total references. These results suggest that technology is a very commonly used term in a model of personalized learning.

Flexible Learning Settings or *Environment* was referenced in 18 out of 26 dissertations. This produced a 69.2 percent frequency of presences in the dissertations. The total number of coded references to *Flexible Learning Settings* across the population was 131.

Leaving of Traditional Teaching Methods or *Models* was also referenced in 18 out of 26 dissertations. This yielded a 69.2 percent frequency. However, the total number of references to this element was only 40.

Student Interest Based Studies was referenced in 17 out of 26 dissertations. This yielded a 65.4 percent frequency reference rate. The total number of references to this element was 116.

Career Minded or *Beyond Classroom Focus* was also referenced in 17 out of 26 dissertations. This yielded a 65.4 percent frequency of reference rate. The total number of references to this element was also 116.

Teacher Role was referenced in 16 out of 26 dissertations. This yielded a 61.5 percent frequency reference rate. The total number of references to this element was 80.

Student Choice was also referenced in 16 out of 26 dissertations. This yielded a 61.5 percent frequency reference rate. The total number of references to this element was 69.

Individual Learning Plan or *Personal Learning Path* was also referenced in 16 out of 26 dissertations. This yielded a 61.5 percent frequency reference rate. The total number of references to this element was 290.

Student Directed Learning, Self-Directed, or *Student Driven* was also referenced in 16 out of 26 dissertations. This yielded a 61.5 percent frequency reference rate. The total number of references to this element was 82.

Mastery Based or *Competency Based* was also referenced in 15 out of 26 dissertations. This yielded a 57.7 percent frequency reference rate. The total number of references to this element was 160.

Teacher Development was also referenced in 15 out of 26 dissertations. This yielded a 57.7 percent frequency reference rate. The total number of references to this element was 106.

Teacher Student Relationships was also referenced in 15 out of 26 dissertations. This yielded a 57.7 percent frequency reference rate. The total number of references to this element was 82.

Student Led Pacing or Personalized Pacing was referenced in 14 out of 26 dissertations. This yielded a 53.8 percent frequency reference rate. The total number of references to this element was 81.

Learning Styles or Modalities was referenced in 14 out of 26 dissertations. This yielded a 53.8 percent frequency reference rate The total number of references to this element was 36.

Blended Learning was also referenced in 12 out of 26 dissertations. This yielded a 46.2 percent frequency reference rate. The total number of references to this element was 173.

Stakeholder's Involvement and Relationship was referenced in 11 out of 26 dissertations. This yielded a 42.3 percent frequency reference rate. The total number of references to this element was 39.

Community Involvement or Engagement was referenced in 12 out of 26 dissertations. This yielded a 46.2 percent frequency reference rate. The total number of references to this element was 34.

Collaboration Between Students was referenced in 11 out of 26 dissertations. This yielded a 42.3 percent frequency reference rate. The total number of references to this element was 28.

Student Academic Goals was referenced in 11 out of 26 dissertations. This yielded a 42.3 percent frequency reference rate. The total number of references to this element was 24.

Project Based was referenced in 11 out of 26 dissertations. This yielded a 42.3 percent frequency reference rate. The total number of references to this element was 48.

Utilizing Data was referenced in 10 out of 26 dissertations. This yielded a 38.5 percent frequency reference rate. The total number of references to this element was 70.

Socio-Emotional Support was referenced in 10 out of 26 dissertations. This yielded a 38.5 percent frequency reference rate. The total number of references to this element was 20.

Student Ability Based was referenced in 9 out of 26 dissertations. This yielded a 34.6 percent frequency reference rate. The total number of references to this element was 19.

Student Self-Regulation was referenced in 9 out of 26 dissertations. This yielded a 34.6 percent frequency reference rate. The total number of references to this element was 21.

Lower Teacher Student Ratios was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 13.

Personalized Assessment was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 14.

Personalized Curriculum was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 14.

Personalized Interventions was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 12.

Multiple Types of Instruction was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 15.

Teacher and Student Collaboration or *Conferences* was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 17.

Student Engagement was referenced in 8 out of 26 dissertations. This yielded a 30.8 percent frequency reference rate. The total number of references to this element was 21.

Student Profiles was referenced in 7 out of 26 dissertations. This yielded a 26.9 percent frequency reference rate. The total number of references to this element was 16.

Individual Feedback was referenced in 7 out of 26 dissertations. This yielded a 26.9 percent frequency reference rate. The total number of references to this element was 12.

Based on State Standards and Set Curriculum was referenced in 7 out of 26 dissertations. This yielded a 26.9 percent frequency reference rate. The total number of references to this element was 19.

Student Ownership or *Agency* was referenced in 7 out of 26 dissertations. This yielded a 26.9 percent frequency reference rate. The total number of references to this element was 26.

The most prevalent *Elements* described above answers the second part of research question 2. The resulting data identifies a clear perception of what researchers suggest should be included in a model of personalized learning. The implications are discussed in chapter 5. In the next section, I offer an answer for research question 3.

Research Question 3: Personalized Learning and Christian Education

The data collected in this research has presented information for a clearer understanding of personalized learning. Accordingly, a clarity of personalized learning is valuable to Christian education in particular because it allows such schools to simultaneously respect the *imago Dei* of students while growing areas of weakness and strength. This process ultimately compliments the greater goal of Christian education. As mentioned in chapter 2, Gregg Allison points out that a part of Christian education's goal is "to shape people with remarkable physical, intellectual, creative, social, and relational abilities so as to further their transformation into the image of Christ. Encouraging Christ followers to reorient the use of their God-given gifts from selfish ends to God-honoring ones . . . is the high calling of Christian education."[4] Personalized learning can help accomplish the goal of shaping students into the image of Christ if it can be implemented well. The clarity of terminology, benefits, and elements of personalized learning helps with the implementation process. This research provides insight into the first steps for integrating this secular educational philosophy to Christian education appropriately.

Research question 3 asks *What does an analysis of personalized learning implementations in the secular school systems offer Christian education?* By nature, this question suggests that a synthesis of this researched data is needed to be usable for

[4] Gregg R. Allison, "Humanity, Sin, and Christian Education," in *A Theology for Christian Education*, by James R. Estep Jr., Michael J. Anthony, and Gregg R. Allison (Nashville: B & H Academic, 2008), 191.

Christian education. In this answer to research question 3, I provide several contributions that this research's analysis offers to Christian education.

Common Terms and Christian Education

Research question 1 was concerned with identifying commonalities in terminology as a means to aide in clarity of usage. As identified in chapter 2, the current status of personalized learning lacks clarity in definition, benefits, and elements of personalized learning. Accordingly, a Christian educational group looking to adopt a personalized learning model to their educational setting would have difficulty in defining what personalized learning is and what a model of personalized learning details. A list of commonly used terminology associated with definitions, benefits, and elements of personalized learning would help those seeking to implement it have a clearer starting point. The terminology regarding definitions would help create a definition suitable for gaining support from administration and stakeholders and help integrate personalized learning to a Christian educational setting. Similarly, the terminology presented in this research allows for a clear list of each, thus easing the difficulty in determining appropriate fit and what could be included in a model of personalized learning. These points are explained below.

Defining personalized learning allows educators to begin an implementation process with a common understanding that could help gain support from administration and stakeholders. For Christian educators, a common definition could help explain and minimize common misunderstandings about personalized learning. Clear explanations would help Christian educators seeking approval from their governing body to better explain personalized learning, thus helping them to gain support for implementation. This solidified definition not only would help explain personalized learning to a governing body but also—and perhaps more importantly—would allow clear communication to parents of students and other stakeholders. Defining the previously undefinable also helps

Christian education appropriately integrate personalized learning that is rooted in a constructivist philosophy of education.

A Christian educator seeking to implement a personalized learning model may face resistance from peers because of the constructivist philosophy upon which personalized learning was built. The identification of common terms concerning definitions for personalized learning allows a starting place from which to redefine personalized learning. A clear definition is needed for usage in a Christian setting. This research offers the beginning of a definition, thereby changing a facet of the relativism so common in constructivism to align more with a Christian philosophy of education founded upon absolute truth. The results could be a more palatable form of personalized learning. This is not the only way common terminology can help Christian education make use of personalized learning.

Common terms regarding benefits and elements identified in this research also have offerings to the Christian educational setting. A clear centralized list of identifiable claims of the benefits of personalized learning helps Christian educators determine if a personalized learning approach would help an area of need within their school. That specificity would save time and expense when discerning a method of education for their student population's needs. Likewise, common terms regarding the elements of personalized learning allows educators insight into the elements needed to incorporate a model of personalized learning suited for Christian education. Common terminology would allow those building the model to distinguish between elements best suited for their particular Christian educational setting. A clear identifiable list of elements shows an actionable facet beyond a definition of personalized learning. The data concerning the most prevalent components also have offerings for Christian education. The next subsection investigates these possibilities.

Emergent Benefit and Elements and Christian Education

The most prevalent *Benefits* and *Elements* identified in this research have offerings to Christian education. The *Benefits* suggest that personalized learning is worthwhile to investigate as an educational model. The *Elements* can be molded as ways to further implement theological beliefs concerning the *imago Dei* in Christian educational settings. The *Elements* identified in this research also suggest that a personalized learning model can be altered according to a school's needs. These offerings are further explained below.

The top emergent *Benefits* of personalized learning were *Academic Achievement* and *Serves All Students*. These benefits may be of particular interest to any Christian educators seeking to diversify their student population with a broad range of academically performing students. A predetermined model of education that helps students academically excel and serves students from a range of abilities and backgrounds would benefit the transition of such students to a Christian education setting. The result of applying personalized learning could allow Christian education to serve an at-risk student population while simultaneously pushing gifted students to a more advanced academic level. An incorporation of benefits is not the only applicable aspect of personalized learning to Christian education.

The most prevalent *Elements* of personalized learning identified in this research have offering to Christian education, too. The top elements of *Student Need* and *Student Centered* are rooted in a humanistic approach to education.[5] However, the potential exists to alter these focuses with a Christian perspective concerning the *imago Dei*, thereby making them very useful in a model of education. A holistic approach to the *imago Dei* proposes that persons are pre-fall valuable in the sight of God. It suggests that

[5] These elements are best understood as educational designs meant to meet the individual needs of students and designs that are centered on the educational paths that students prefer.

our uniqueness reflects the uniqueness of God. The elements of *Student Need* and *Student Centered* can be understood from this perspective and therefore can be put to use in a model of personalized learning that has become Christian.

An ancillary finding of this research is that none of the *Elements* identified was present in all of the dissertations. This finding suggests that the elements of personalized learning could be considered interchangeable between models, changing as needed. Christian education administrators could take and leave elements as needed to build something that fits the educational setting in which they currently find themselves. Doing so would allow them to meet the *Student's Needs* and perhaps renew a *Student Centered* focus if needed.

The suggested applications of this research to Christian education answers research question 3. In summary, there are several contributions that a clarified collection of terminology concerning definitions, benefits, and elements of personalized learning can offer a Christian educational setting. It eases implementation and offers a starting point for conversations with governing bodies and stakeholders. The most prevalent benefits and elements also have an offering for Christian education. The benefits suggest that personalized learning could be put to use for increasing academic achievement and that it promotes a way to serve a broad range of students. The elements can be implemented in ways that encourage a greater respect for the *imago Dei*. This research also offers a way for Christian education to create its own model of personalized learning. An application of personalized learning allows a Christian educational setting to meet their high calling of Christlike education through valuing and serving all students equally due to their status as image bearers and their unique needs as creatures.

Concluding Summary

The research questions for this project were as follows:

1. Are there any identifiable commonalities in terminology regarding personalized learning in these studies?
2. What elements and benefits of personalized learning emerge from the collected dissertational studies?
3. What does an analysis of personalized learning implementations in the secular school systems offer Christian education?

The first research question was answered by completing the coding process on the dissertations in the population. The resulting data was then analyzed for commonalities in terminology concerning definitions of personalized learning. This coded data was then queried using a word frequency test. The resulting table and visualization showed the commonalities in identified terminology concerning definitions of personalized learning. Next, the coded information concerning elements and benefits of personalized learning was surveyed to collect the top categories of each. This list suggests the total amount of commonly used terms in the areas of benefits and elements of personalized learning. Lastly, a matrix coding query was implemented to identify co-occurrences of personalized learning. The query identified several co-occurrences of coded elements and benefits. While there were no strong correlations, this data suggests that authors associated some of the benefits and elements, therefore identifying slight commonalities in each.

Research question 2 was answered by implementing frequency and prevalence statistics. After the 26 dissertations in the population were analyzed and coded, several different coding categories emerged as most prevalent. Each code was then tested with frequency and percentage analysis with the purpose of generating a measure of prevalence across the population. The results identified the most prevalent emergent elements and benefits of personalized learning.

Research question 3 was answered by synthesizing the data to make a connection between personalized learning and Christian education. The main offerings of an analysis of personalized learning to Christian education is a type of guide for those

who would attempt to implement it. An appropriate integration which seeks a Christ-centered focus on education with a clear understanding and implementation of the *imago Dei* could benefit students in Christian education.

CHAPTER 5

CONCLUSION

In this final chapter, I first review the purpose of this project and the project's research questions. Second, I analyze the findings from chapter 4. Third, I offer implications of the research concerning each research question. Fourth, I suggest some applications of the research to areas of educational settings. Fifth, I state the limitations of the research. Sixth, I evaluate the strengths and weaknesses of the research design. Seventh and finally, I give recommendations for future studies.

Purpose Statement

The goal of this study was to further the understanding of the terminology, elements, and benefits of personalized learning. Gathering the data in this research holds valuable insight that will add to the order of terminology, elements, and benefits of personalized learning and thus produce easier access for implementation in Christian education. For this educational setting, the purpose of this research was to identify an evidence-based order utilizing the benefits and elements of personalized learning model.

Research Questions

This study contained three questions:

1. Are there any identifiable commonalities in terminology regarding personalized learning in these studies?
2. What elements and benefits of personalized learning emerge from the collected dissertational studies?
3. What does an analysis of personalized learning implementations in the secular school systems offer Christian education?

Summary of Analysis

The results of this research are communicated in chapter 4. In this section, I further my analysis of chapter 4 findings. This section follows the research questions in order, highlighting the more prominent findings of each. The topics covered in this section are an analysis of terminology and an analysis of highest and then lowest elements and benefits identified in this research.

Commonalities in Terminology

Research question 1 sought to find any commonalities in usage of terminology in reference to personalized learning across the selected population. This research question was answered in three ways: (1) an analysis of coded information concerning definitions, (2) coding of all elements and benefits to show common terminology, and (3) a matrix coding query to identify co-occurrences of elements and benefits.

The results of the word frequency query preformed on the definitions coded from the population yielded a list of most frequently used words. In 17 of the 26 dissertations, there were 48 total codes containing information related to definitions. The frequency query yielded a total of 465 words. This list showed what the authors from a decade in review have used in their definitions. An analysis of the most prevalent terminology gives insight into the definition of personalized learning. For better clarification and ordering of a hopeful future definition, I have grouped them into similar topics. For example, the top four words—*learning*, *students'*, *personalized*, and *instruction*—are expected to be included in a definition of personalized learning. These words offer some insight into authors' understanding of personalized learning but are vague to readers and need clarification. However, the next few words in the list—*needs*, *interests*, *educators*, and *tailoring*—show more of an insight into what the phenomenon of personalized learning contains. According to this data, the personalized learning definition will include student needs, interests, and the tailoring of educational content to

the students. Assumedly, the *educators* are the ones creating the personalized learning setting for the students. The next word—*individual*—also shows more clues concerning authors' understanding of personalized learning. The words *needs, interest, personalized,* and *tailoring* show a focus on the student congruent with the findings of the *Elements* of personalized learning. The top two *Elements* identified in this research were *Student Need* and *Student Centered*. This result suggests that the definitions and elements identified through the coding process support one another. There are identifiable commonalities in these lists, suggesting that there can be a common definition developed from them. Confirming these terms allows for a continuing of the evolution of personalized learning, thus offering more clarity for subsequent researchers.

Emergent Elements

The literature review, or chapter 2, identified a disagreement among researchers concerning the elements of personalized learning. The identification of the most prevalent elements of personalized learning from a decade of dissertations offers clarity on this matter. The resulting coded elements are not only a prevalence (used to answer research question 2) but also generated a large list of elements mentioned across the population. The results of the common terms surrounding elements were numerous.

The total number of elements identified in this research was 164. Sorting by prevalence and identifying the top elements resulted in a list of the 37 most prevalent elements of personalized learning. The array of perspectives in the literature base contain varying suggestions about what elements should be in a model of personalized learning. The elements identified in chapter 4 offer a collected and sorted order of suggestions about what should be included in a model of personalized learning.[1]

[1] It is important to note here that there was no single element mentioned in every dissertation.

The elements identified were not surprising. They follow the descriptions of personalized learning prevalent in the literature base. Generally, this research was a support and clarification of what we already have access to regarding personalized learning. Questions of clarification were answered, and as I was considering how to further analyze the most prevalent elements identified in this research, I realized that the 37 most prevalent elements could be sorted in four different categories if viewed through the question *How can these be actualized in a school?* Those categories are as follows: *Implemented through a Personalized Learning Plan*, *Dependent on a School-Level Administrator*, *Teacher Dependent,* and *Student Dependent*.

In the first category, *Implemented through a Personalized Learning Plan*, there were 30 *Elements* that could be categorized in this way. They are as follows: *Student Need, Student Centered, Technology, Flexible Learning Settings or Environment, Leaving of Traditional Teaching Methods or Models, Student Interest Based Studies, Career Minded or Beyond Classroom Focus, Student Choice, Student Directed Learning (Self-Directed or Student Driven), Mastery Based or Competency Based, Student Led Pacing or Personalized Pacing, Learning Styles or Modalities, Blended Learning, Stakeholder's Involvement and Relationship, Community Involvement or Engagement, Collaboration Between Students, Student Academic Goals, Project Based, Utilizing Data, Socio-Emotional Support, Student Ability Based, Personalized Assessment, Personalized Curriculum, Personalized Interventions, Multiple Types of Instruction, Teacher and Student Collaboration or Conferences, Student Profiles, Individual Feedback,* and *Based on State Standards and Set Curriculum*. Analyzing and sorting the elements in this way offers even further clarification of the elements because they now have an actualized way of being implemented. Of the 37 elements, 27 could be implemented in a personalized learning plan.

The other three categories and their inclusions are as follows. The second category, *Dependent on a School Administrator*, contains *Teacher Development, Lower Teacher to Student Ratios,* and *Teacher Role*. The third category, *Teacher Dependent,* contains *Individual Learning Plan or Personal Learning Paths, Teacher Student Relationships,* and *Student Engagement*. The last category, *Student Dependent*, contains *Student Ownership or Agency* and *Student Self-Regulation*. These categories demonstrate not only the intricacies of personalized learning but also the need for multiple layers of collaboration among educational roles in personalized learning in order to be successful.

Emergent Benefits

The coding process was also concerned with identifying and coding the benefits of personalized learning in the population. There were several identified, and many showed themselves to be most prevalent, thus answering research question 2. In this section, I analyze the results, suggesting possible insights that they reveal into the perspectives of the population of dissertation authors.

The benefits of personalized learning that emerged in this research resulted in a total of 48 benefits. As highlighted in chapter 4, 7 of the 48 were most prevalent. There were less emergent benefits than elements. The comparison between the benefits and elements suggests that the dissertations were more concerned with elements. It also suggests that there is a need to investigate further into the benefits of personalized learning.

The benefits suggest that the authors were concerned with meeting the lower-achieving students with personalized learning. There are five of seven benefits that support this analysis. The emergent benefits *Increased Student Engagement; for at Risk, Underserved, or High Needs Students; School Reform; Student Motivation; and Increase in Positive Perception of Education* have a common theme of movement from lower to higher. For example, the benefit *Increased Student Engagement* assumes the need of

increase in the area of student engagement. This suggests that authors view personalized learning to be fitted well for schools with higher needs.

However, there is a perspective represented in these findings that would suggest a broader application of personalized learning to the higher-achieving students. This perspective is supported by the two most emergent benefits: *Academic Achievement* and *Serves All Students*.[2] These elements suggest that an already-achieving student could advance toward further achievements through personalized learning. If these benefits are true and the insights of authors' perspectives are accurate, then there is the implication that personalized learning could add an additional level of available academic advancement not currently present in the glass ceiling represented in the current percentage method of grading.

Benefits and Elements with the Lowest Prevalence

The focus of this research was on the most prevalent benefits and elements of personalized learning. An ancillary finding of this research was the most infrequent or lowest prevalent benefits and elements. In this section, I list these findings and analyze them for their suggested offerings for personalized learning.

There are three perspectives to view the results below. A first perspective considers these benefits of personalized learning as insignificant and to be ignored. A second perspective could view these benefits as containing a single important finding, one that other researchers missed, making the insignificant findings valuable. A third perspective could suggest a coder reliability issue and that these codes could perhaps fit into another common subcategory.

[2] At this point, the argument could be made that *Academic Achievement* also assumes the need for achievement, or the movement from lower to higher. However, the contextual coding of this category further suggests support for the perspective presented in this analysis.

Least prevalent benefits. The benefits below were mentioned in only 1 out of 26 dissertations in the population. This yielded a prevalence percentage of 3.85 percent. Their total references varied but ranged from 1 to 16 with an average of 2.5 references.[3] The list of benefits with the lowest prevalence is as follows: *Increase in Course Completion Rates, Increased Student Attention, Capitalize on Strengths as Learners, Increase Student Time on Task, Student Comfort with Academic Risk Taking, Increase Student Effort, Better Than Traditional Learning Environments, Increased Efficiency, Close Gaps in Student Knowledge, Non-Cognitive Skills Development, Student Persistence, Self-Management, Mindset, Content Mastery, Prepares Students for School Based Assessments, Positive School Climate, Improved Student Outcomes, Belonging to a Community, Improved Student Affect, Improved Well-Being,* and *Beneficial Quality of Experience*.

I suggest that the benefits that need further investigation are *Improved Student Outcomes* and *Increase in Course Completion Rates*. These two benefits, although only mentioned in one dissertation, seem to be most aligned with what personalized learning offers. They are also testable benefits that, if found to be accurate, would help further personalized learning research.

Least prevalent elements. The least prevalent elements of personalized learning were only mentioned in 1 out of 26 dissertations. These results also yielded a percentage of 3.85 percent. The total references for this group ranged between 1 and 44 references with an average of 3.75 references.

The lowest percentage *Elements* of personalized learning are as follows: *Student Effort Based, Time Flexible, Student Led Conferences, High Expectations, Content Structure and Quality, Student Background, Alternative Forms of Grading,*

[3] The total amount of references would be accounted for when considering that a single dissertation about a particular benefit could mention it many times.

Classroom Redesign, Discipline, Measurable Results, Teacher Led Pacing, Module Driven, Multiple Courses within One Class, Teamwork, Adaptive to Individual Students, Independently Personalized, Planning for Learning Process, Micro-Level, Macro-Level, Best Knowledge on Learning Teaching, Self-Contained, Student Personality, Student Planned Curriculum, Student Exploration, Self Sufficient, Growth Mindset, Contextualization, High School Advisory, Collegial School Culture, Teacher Attend Learning Readiness, Instructional Rate, Student Maintained Planner, Student Value, Recognition of Accomplishments, Commitment, Student Problem-Centering, Multi-Media Product, Ubiquitous Access to Information, Intensity, Self-Monitoring, Student Curiosity, Student Active Learning, Positive Learning Environment, Structures, Face to Face, Learning Is Engaging, Learning is Meaningful, Student Support Teams, Student Competence, Traditional Coursework, Service-Learning, Dual Enrollment, Student Relatedness, Learning by Doing, Credits Based, Student Self Advocacy, Teacher Knowledge of Students, Foster Knowledge Building, Collective Responsibility, Communication, Culturally Relevant, Coaches, Inquiry Based Learning, Social Learning Theory, Critical Pedagogy, Student Self-Organized, and *One on One*.

Some combination of the three perspectives listed above can readily explain this list. However, there are several elements that need further investigation and could be deemed valuable to personalized learning: *Culturally Relevant, High Expectations, Alternative Forms of Grading,* and *Service Learning*. These elements could offer important factors to a successful model of personalized learning because of the important aspects of education they offer to students. *Culturally Relevant* would allow students from multiple backgrounds more readily accessible content. *Alternative Forms of Grading* seems to support a project-based approach that fits personalized learning well. *Service Learning* would be an aspect that engages the community and stakeholders of the school.

Implications of Research

The strongest implication for this research is that it offers a starting place for personalized learning to gain ground among current educational models. This research orders the current research on personalized learning to a point of reference. It is applicable for several educational settings. This research offers educators a survey of common terms to help them understand what is potentially included in a definition of personalized learning. It also offers a list of the most used benefits to help inform their decision on proceeding with personalized learning by looking at the possible outcomes prior to implementation. Additionally, it offers a list of the most prevalent elements written about in the past ten years of research in connection with personalized learning.

Common Terminology

Common terminologies were identified in any definitions found in the populations. While there were no emergent common definitions of personalized learning found, this research takes defining the undefinable one step closer. The implication of this would allow researchers a place either to agree or to create new nuanced movement away from personalized learning in education.

The implication of a definition would benefit educators seeking to gain support in implementing personalized learning in their context. This support could be from legislators who need clarity in definitions to move forward. It would also allow accessibility to parents or stakeholders concerned with changes away from traditional teaching methods. The clarity in definition would also allow outside groups seeking to help a school to assess personalized learning more readily. These groups could be colleges with interns coming to the school or places that offer tutoring services to the school's student population.

Common terms and elements could also move the progression of personalized learning more towards a standard model. If a standardized model could be built, then

perhaps benefits and elements could be more accurately measured in their successes for teaching students. Therefore, a standard model of personalized learning could continue to further research concerning personalized learning toward greater usability.

Emergent Benefits and Elements

This research offers a place to start building a model of elements concerning personalized learning. The benefits of personalized learning, authors claim, have been sorted and identified. The most frequent have been documented. This allows for an institution to identify more readily an argument as to why personalized learning should be implemented.

This research offers Christian education a starting place to look at intentionally integrating elements and benefits of personalized learning into their educational setting. So far, there have been minimal investigations into Christian education and personalized learning. This research is attempting to stand in the gap between a secular model of education and Christian education. This suggests that personalized learning has merit and benefits for Christian Education. It offers Christian education a way to continue pressing the great work already being done into greater success and accessibility for partakers.

Applications of Research

This research applies to various areas of education. Mainly, its application can be narrowed into making use of an ordering of a large amount of information. Its usefulness is found in its time saving and clarity. The question of who could use it is also narrowed into a group of people who would be interested in personalized learning. Below are a few applications of this research to varying educational settings. I suggest the application of this research in three educational settings: parents of public school students, parents of homeschool students, and churches. After this, I make an application

of this research to Benjamin Bloom's two-sigma problem. Finally, I propose how technology can be combined with personalized learning.

One group that can make use of this research is parents of students in public education. This research could provide information about terminology for parents looking into a personalized learning setting at a school. Identifying terminology connected to education can help them have the knowledge needed to understand this model of education. It would allow them to participate with a greater level of insight in parent-teacher associations, committees, or student advocacy situations.

This research also allows parents insight to a clarified path to create a type of personalized learning for their children at home. The teacher-student ratio in the homeschool setting often minimizes some difficulties teachers would have in a public school setting. Homeschool parents could, after considering the elements identified here, create a personalized learning plan that allows their children to learn with the benefits of both personalized learning and homeschooling.

Using this research as a starting point, personalized learning can be adapted to fit the needs of a church focused on Christian formation. This research, similar to suggestions offered in research question 3, allows a church insight into elements of personalized learning that could be changed and implemented in a Christian formation setting. The elements of *Student Need* and *Student Centered* align with the general goal of meeting the spiritual needs of congregants. Perhaps this could spark the church to keep a personalized spiritual learning plan for their congregants.

The applications suggested above can be narrowed into the broad category of clarification of personalized learning and putting that to use in multiple settings. The ones suggested were mainly pertaining to parents and churches. Other applications to Christian education have previously been considered in chapter 4. This is not an exhaustive list of applications of this research. There is however one application of this research that needs

deeper examination, namely, an application to the two-sigma problem mentioned in chapter 2. The next section contains possible applications to the advancement of Bloom's seminal work.

An Application to Bloom's Two-Sigma Problem

In chapter 2, I suggested that personalized learning could offer advancement to Bloom's two-sigma problem. In this section, I offer suggestions on how to apply personalized learning to Bloom's research. I offer an application of the elements *Student Interest Based Studies* and *Technology* as well as a possible solution to the problem of scalability identified by Bloom through personalized learning plans.

Incorporating a model of personalized learning that utilizes the element of *Student Interest Based Studies* combined with suggestions from Bloom's research for most effective learning scenarios could offer new movement in the two-sigma problem. Bloom's findings were contingent on teaching a standardized set of information to students in three different scenarios. The aspect of student choice in content was not a tested variable. Adding an aspect of a personalized learning model, namely, *Student Interest Based Studies*, could develop new data in the study. This idea is further supported by the coding matrix query. One co-occurrence found in the matrix coding query suggested that the element *Student Interest Based Studies* is connected to the *Student Motivation* benefit of personalized learning. Coincidentally, student motivation is one part that Bloom suggested would help students learn effectively across the multiple settings his research tested.[4]

The next application of personalized learning to Bloom's work is the third most prevalent element of personalized learning identified in this research, *Technology*.

---

[4] Benjamin S. Bloom, "The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring," *Educational Researcher* 13, no. 6 (July 1984): 7.

Bloom found that student mastery of content was most successful when it was done in a tutoring setting. The second most successful setting for student mastery was a mastery-based learning setting. The least successful setting was a conventional setting.[5] The incorporation of personalized learning with technology may allow the 1:1–1:3 teacher-student ratio to become more scalable. A model of personalized learning can be developed that uses the information and design of computerized classes. This design could add an element that mimics the low teacher-student ratio identified in Bloom's tutoring scenario. Perhaps technology could also be implemented in the conventional setting as a way to negotiate the discrepancy between it and the tutoring setting.

Bloom's greatest question concerning the two-sigma problem was the scalability of a 1:1–1:3 tutoring setting. Scalability is an issue due to the current overall design of the educational system and its inability in many cases to procure funding for enough teachers. Seemingly, in this current model, there is no way to reproduce Bloom's results in a larger classroom setting. Personalized learning could offer simulations mimicking a similar 1:1–1:3 golden ratio presented by Bloom. The elements identified in this research are all scalable for the modern conventional classroom and could perhaps be combined in a few groups in order to mimic a 1:1–1:3 ratio. Personalized learning plans are a way to incorporate aspects of Bloom's tutoring plan and a personalized learning model.

Personalized learning plans, as mentioned previously, could be developed to contain 27 of the 37 most prevalent elements of personalized learning. The ability to reflect all of these elements through one medium could produce a similar environment conducive to Bloom's tutoring plan. The difference would be that children would be receiving the information in a personalized way through a different medium than a

[5] Bloom, "The 2 Sigma Problem," 5.

teacher. However, the effect could be the same: students would have individualized access to the content; they would then be pushed to mastery. Personalized learning plans also seem to fit current expectations of specialized plans for unique student populations. individualized educational plans (IEPs) are the current normative requirement for special education in the United States, and in some states, English Language Learners (ELLs) require an individualized language plan that tracks needs and advancements in language acquisition. The precedent set by these two student populations suggests that a personalized learning plan would be of use to the general student population.

Creative grouping strategies may be another way to combine personalized learning to mimic the one-to-one tutoring system Bloom found so effective. The result could press personalized learning into a scalable model for educational settings while simultaneously seeking to solve the two-sigma problem. Grouping strategies could help mitigate the strain of one-to-one tutoring on the current traditional teaching model. Student inventories could help. They are a way to identify students' likes, and they support the identified *Student Interest Based Studies* element. If students' interests were identified through a student inventory, the information could be used in both personalized learning plans and creative grouping strategies. For teachers seeking to implement a personalized learning plan, the thought of several students' being grouped similarly exploring topics of interest would be a welcomed mitigation of the difficulties of implementing a new educational model. There are other grouping strategies that may also help reduce the resource expense of personalized learning.

Grouping strategies could also be expanded to include the identified *Learning Styles or Modalities* element, which refers to the way students prefers to learn. Grouping based on this criterion could further stretch teacher resources while developing a personalized learning model. The narrowing of students into a group of similar learning

styles would allow teachers to create lessons tailored to these aspects of students' educational preferences.

I have suggested that personalized learning can be applied through three possible ways in order to answer Bloom's two-sigma problem. First, I proposed an application of the most prevalent elements of personalized learning, *Student Interest Based Studies* and *Technology*. Second, I suggested that personalized learning plans could be implemented as an answer to the problem of scalability. Third, I recommended a combination of grouping strategies and elements. These parts, if incorporated well, offer a path for advancement to Bloom's research.

Technology and Personalized Learning

The element of *Technology* was identified as part of personalized learning in 19 of 26 dissertations. However, the question still remains, *How should technology be implemented as one of the elements of personalized learning?* While applications of technology in personalized learning vary, one possibility is the blending of artificial intelligence and intelligent tutoring systems.

One growing advancement in technology is the development of artificial intelligence and its implications for education. The suggested blending of artificial intelligence and intelligent tutoring systems could provide a powerful ally for the application of personalized learning in our current educational setting. Shubham Joshi, Radha Krishna Rambola, and Prathamesh Churi suggest the following benefit of incorporating artificial intelligence, intelligent tutoring, and personalized learning:

> Personalizing Learning: The program in AI, commonly called an intelligent system tutor (ITS) or adaptive tutor, involves student's dialogue, answering questions, and giving feedback. ITS and adaptive teachers adapt learning materials, pace, sequence,

> and severity to meet the needs of each student. The AI could also support a student's special needs, such as teaching children-to recognize facial expressions.[6]

The possible usages of a computerized intelligent tutoring system tuned with the brain of artificial intelligence could have great success if mixed with personalized learning. The combination could move and bend a curriculum to meet even the most difficult educational needs of students. The blend of personalized learning, artificial intelligence, and intelligent tutoring systems is another a way to maximize limited resources. This blend could also allow the implementation of a model of personalized learning more quickly to an educational setting.

This research's identification of elements of personalized learning allows more insight to programmers and developers of such systems. Likewise, the identified benefits allow insight into what areas could be measured in the effective implementation of these systems. As previously mentioned in this chapter, this research offers a starting point. A team interested in building a model of personalized learning using technology could benefit from this research.

Limitations

This section provides information regarding the limitations of this research. First, I discuss the general limitations of this research application to populations, the generalizable inference of the results, and information concerning the limits of the benefits and elements contained herein. Second, I consider the limitations of the matrix coding query. Third, I discuss the limitations of statistical analysis used in this research.

---

[6] Shubham Joshi, Radha Krishna Rambola, and Prathamesh Churi, "Evaluating Artificial Intelligence in Education for Next Generation," *Journal of Physics, Conference Series* 1714, no. 1 (2021): 2.

Limitations on the Scope and Population

The population inclusion guidelines limited this research to American secondary school educational settings in the public, private, and charter school settings. The most prevalent benefits and elements of personalized learning would be existent in a larger population sample. From a sample size of 26 dissertations concerning populations, an inference can be made that other dissertations with similar topics concerning personalized learning will contain comparable frequencies of similar elements and benefits of personalized learning.

The limitations of this research would reach only to secondary educational settings. The results would not include generalizable information about personalized learning in other educational settings, such as elementary school, middle school, and higher education, and about personalized learning in other countries. More research would be needed to make assumptions about the terminology, benefits, and elements in these settings.

Limitations include the following: This research only identified benefits and elements of personalized learning suggested by other authors. It did not test each benefit and element for its actual increase in a particular area of claim. It is beyond the scope of this research to claim these as actual benefits or most effective elements of personalized learning. This research only identifies what authors in the past ten years have claimed in their doctoral-level research.

The Matrix Coding Query and Co-Occurrences

The matrix coding query used to give a partial answer to research question 1 showed co-occurrences of elements and benefits coded at the same time. An analysis of this kind is similar to a correlation test, but it is important to note that the two are distinct from each other. The results from the matrix coding query were inconclusive because there were not strong enough numbers to support anything more than mere co-

occurrences. The coding scheme, while it supported multiple coding placements, was designed to answer the research questions. However, what this query did reveal was a glimpse into possible connections between authors' understanding of these terms. These results suggest the possibility that stronger correlations may be present; however, a specifically designed research question, coding method, and process should be created to specifically increase this measure's accuracy.

Statistical Analysis

The statistical analysis this research employed was basic descriptive analysis. The research only required measures of prevalence and frequency. The frequency and prevalence were identified after the coding process yielded overall data on the number of references in each code. These results were measured and isolated in order to describe the prevalence of each of the codes by percentage. The coding process yielded insufficient data required to perform a valid linear regression analysis. The coding process also did not produce sufficient information necessary to complete any valid correlation analysis.

This insufficiency was due to the research's design as a directed content analysis. The research questions were concerned with verifying and describing the existence of particular elements and benefits of personalized learning. According to Hsiu-Fang Hsieh and Sarah E. Shannon, "The goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory. Existing theory or research can help focus the research question."[7] The goal of this research was to extend the understanding of personalized learning through the coding process; therefore the amount of statistical measures appropriate was limited.

Hsieh and Shannon also offer insight into the proper usages resulting from a content analysis:

---

[7] Hsiu-Fang Hsieh and Sarah E. Shannon, "Three Approaches to Qualitative Content Analysis," *Qualitative Health Research* 15, no. 9 (November 2005): 1281.

> The findings from a directed content analysis offer supporting and non-supporting evidence for a theory. This evidence can be presented by showing codes with exemplars and by offering descriptive evidence. Because the study design and analysis are unlikely to result in coded data that can be compared meaningfully using statistical tests of difference, the use of rank order comparisons of frequency of codes can be used.[8]

It is reasonable, then, that this research developed only frequency and rank (prevalence) results, as highlighted in chapter 4.

Strengths and Weaknesses

This section contains the identifications of the strengths and weaknesses of this research. The strengths are (1) the identification of inconsistencies in the current research, (2) the population sample, (3) the integration of this research into educational settings, (4) the development of a rubric to measure and identify elements of personalized learning, and (5) the development of a rubric to measure and identify benefits of personalized learning. The weaknesses are (1) the nature of meta-analysis and of identifying the majority and (2) coder reliability.

Strengths of This Research

The first strength of this research lies in its identification of the inconsistency of agreement on terms, benefits, and elements of personalized learning in the current research. The results of this study identified commonalities of these main categories. These commonalities will help to move the understanding of personalized learning forward toward greater usability. The usability is most readily found in the clarifications of terms and the identification of benefits and elements, thus resolving the inconsistency identified here.

The second strength of this research is its population sample. The inclusion of the last ten years of dissertations helps gather many data points, allowing deeper insight

[8] Hsieh and Shannon, "Three Approaches to Qualitative Content Analysis," 1282–83.

to solutions of these research questions. The 26 dissertations from the ten-year span offer insight into several developing aspects of personalized learning. The population guidelines do not focus solely on the most recent research concerning personalized learning. Another guideline that was a strength was the inclusion of the secondary education perspective from public, private, and charter school settings. While the majority of the population were from a public school setting, there was still the possibility of other research settings. This possibility of including dissertations set in non-public school settings maximized opportunities to identify the most information about personalized learning.

The third strength is the integration represented in this research. This research considers social sciences in order to offer insight into its objective observations of phenomena in the created world. While the interpretation of those results may be disagreeable to a Christian philosophy, a reinterpretation of the objective observations could allow the best of both worlds to be combined. This research is attempting to offer objective discernable observations, reinterpreted to the Christian educational model, for the increased benefit to student achievement, academic and otherwise.

A rubric for identifying the elements of personalized learning. The fourth strength of this research is that it yielded a useable tool to help identify strengths and weaknesses in a model of personalized learning (see appendix 6). The rubric contains the elements identified in this research along with increments to create a numeric score from a personalized learning model. The rubric will measure the existence of elements in the model of personalized learning that a school or organization is seeking to implement.

The goal of the rubric is to aid in clarity for the persons seeking a model of personalized learning. It should aid persons in identifying elements included in an existing model of personalized learning and then in comparing those elements to the most prevalent elements reported in this research. This rubric will reveal areas of strengths or

weaknesses in a model of personalized learning. The following is an explanation of how to use the rubric concerning elements of personalized learning.

The scoring of the rubric has a few subtle differences in each scoring category. The maximum score allowed on the rubric is 5. The scoring categories shown on the rubric are 2–4. The three scoring sections are labeled "2 - Some Features Are Evident," "3 - Element Is Well-Planned for in the Class," and "4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations." The divisions between categories are as follows.

The division between a score of 2, 3, or 4 is meant to highlight actionable details identified in a model of personalized learning. A score of 2 indicates that a model of personalized learning contains information about an element but is lacking a clear plan of implementation. A score of 3 shows the element to have a clear plan of implementation and good information to put the element into use within the classroom. A score of 4 indicates that the model of personalized learning has good information about an element, a plan for implementation in the class, and a schoolwide plan that yields a type of seamless integration into the model of personalized learning being reviewed.

There are only three categories of scoring in the rubric. Scores of 2, 3, and 4 are categorized. The unmarked scoring are the numbers of 0, 1, and 5 that are not categorized. A score of 0 is reserved for an element that is not mentioned in a model of personalized learning. Likewise, a 1 is perhaps mentioned but has no plan for implementation given in the model. A score of 5 represents a model of personalized learning that has exemplary features of an element.

A rubric for identifying the benefits of personalized learning. The fifth and final strength of this research is that it made the benefits identified in this research into a usable tool to help any who are interested in implementing a model of personalized learning (see appendix 7). The rubric is a simplified Yes/No rubric designed to aid in

identifying measurable benefits of personalized learning. Using this rubric to review an implemented model of personalized learning would aid in gaining support for a transition toward personalized learning. It could also allow implementers the opportunity to identify and troubleshot areas of concern in a model of personalized learning.

To use this rubric, a person starts in the left column by asking the question related to the benefit. Then, he or she should move to the right by marking the "Yes" and "No" categories and indicating the answer deemed most appropriate. There is also a space for "Evidence" that could be recorded electronically for ease of access as well as a "Notes" section to indicate further necessary information needed to identify the benefits of personalized learning.

Weaknesses of This Research

The first weakness of this research is that this content meta-analysis measures prevalence and assumes a majority rule. Identification of the most prevalent does not negate the identification of a singular element or benefit of personalized learning that could be a key element to the success of personalized learning. A golden egg, so to speak, could be identified by one author and have minimal power in this research's criteria of prevalence measure. This research has met the parameters set for it, but by the nature of majority, prevalence design could also be missing a key element or benefit of personalized learning.

The second weakness of this research concerns coder reliability. Coder reliability was minimized by the utilization of a single coder, but coding remains, by nature, relative. It therefore presents a weakness of content analysis and, by implication, this research. The coding process was affected by a subjective coder. While the allowance of creating new coding categories as needed helped increase viability, the placement of the codes was still contingent on the person reading the identified references of personalized learning. Therefore, limits exist concerning human

understanding, fatigue, and differences of definitions of phrased describing elements or benefits of personalized learning. Future studies will have the convenience of this research as a guide. Perhaps this fact will allow them to develop predetermined rules for coding into categories and subcategories. The addition of such would help increase coding validity.

A third identifiable weakness of this research, and of content analysis research in general, lies in the measurement of written text. As mentioned in the section on limitations, this research measured the written text expressing an author's opinions. The validity of the statements made by an author was beyond the scope of this research. This research attempted to mitigate opinion-based statements by including only doctoral-level studies, but there were no criteria for the exclusion of unsubstantiated claims containing a reference to personalized learning in the coding procedures.

Recommendations for Future Studies

There are many possibilities of research to implement structures of personalized learning into a Christian education setting and measure their successes. Perhaps such implementation is also the most needed continuation of this research. The suggested application of personalized learning models suggested in chapter 4 can be turned into research methods and tested appropriately. One example of this is the development of a personalized learning model built from the elements in this research and utilized in a Christian education environment. The resulting measures could support a continuation of integration to Christian education.

Another opportunity for further research is to link the identified benefits and elements to actualized results. Research for measured benefits to measured elements would work together to support or deny overarching claims of personalized learning. There has been research done in associating effectiveness of some personalized learning models to benefits. The addition of this research furthers that need. This research

identifies a clarified list of elements and benefits. These elements and benefits need to move beyond identification to actualized measurements of usefulness.

Another opportunity for further research is to define and support the multiple benefits and elements this research identified. The result would be a taxonomy of terminology, elements, and benefits of personalized learning. A taxonomy of these elements would push the definability of personalized learning forward. It would also add even more clarity to terminology, benefits, and elements of personalized learning.

Another question begs to be answered: *What are the possibilities of applying personalized learning in multiple educational settings?* Here are a few possible populations: homeschool settings, a business employee education setting, and a higher education setting. The opportunity exists for personalized learning in all of these places.

More research is also needed on the elements and benefits of personalized learning in the elementary and middle school setting. Perhaps the same population parameters and directed content analysis could yield more insight into personalized learning. Doing so would allow for a comparison of elements identified in those settings and in the secondary settings with which this research was concerned. The insight gleaned from this study would add clarity to the nuances of personalized learning.

Another suggested content analysis research population is found in the popular literature base. There are several books written at a more accessible level about the topic of personalized learning. These could become an entire unique population. A content analysis similar to this research that uses such materials would yield a data set identifying trends in perceptions of personalized learning. The results could demonstrate variances in understanding from the scholarly level to the popular level.

More research is also needed on the furthering of technology, artificial intelligence, intelligent tutoring systems, and personalized learning. There are promising offerings of technology to the area of personalized learning. Perhaps a research plan to

incorporate various doctoral-level candidates from a field of research in education, technologies, and artificial intelligence could be created. A team comprised of specialists could collaboratively design and test applications of personalized learning for effectiveness and usability.

The last recommendation for future research pertains to Bloom's two-sigma problem. This research identified the possible application of personalized learning models to Bloom's tutoring and scalability in the two-sigma problem. This research therefore suggests a possible continuance of measuring Bloom's settings with the added elements of personalized learning suggested above. The results could offer supporting evidence of the usability and benefit of personalized learning. A reapplication of the successes identified by Bloom's in a scalable way would be of exceeding benefit to American education and offer great insight into all educational settings.

APPENDIX 1

BIBLIOGRAPHY OF DISSERTATIONS INCLUDED IN THE POPULATION

Barrett, Dustin Dale. "A Mixed Methods Study to Measure the Impact of Mastery-Based, Personalized Learning on At-Risk Student Achievement." PhD diss., Northwest Nazarene University, 2017.

Beese, Elizabeth Brott. "How Do They Do It? Describing Nontraditional Designs for Creating and Carrying Out Personalized Plans for Learning in Three High Schools." PhD diss., Purdue University, 2018.

Bicer, Alpay. "Effect of Personalized Learning Paths on Learning Quadratics in Algebra." PhD diss., Arizona State University, 2015.

Bingham, Andrea J. "From Meaning-Making to Expansive Learning: How Contradictions Shape Teachers' Implementation of Technology Based Personalized Learning." PhD diss., University of Southern California, 2015.

Brodie, Beth. "Perceptions of the Impact of High School Advisory on Academic Success, Connectedness and Personalization of Education." EdD diss., University of Vermont, 2014.

Cano, Sandra Esther. "The Influence of Blended Learning on Post-Secondary Readiness and Academic Achievement in Mathematics: A Personalized Approach to Learning." EdD diss., University of Houston – Clear Lake, 2019.

Cord, Katherine Elizabeth. "Instructional Leader Influence in 1:1 Technology Integration Creating Student-Centered Learning." EdD diss., Grand Canyon University, 2016.

Ford, Christopher Jay. "The Beliefs of Secondary Teacher on Personalized Learning for Students Through the Use of Instructional Technology." EdD diss., Lindenwood University, 2018.

Harrity, Sheila M. "Education's Perfect Storm: A Case Study of the Transformation of Worcester Technical High School." EdD diss., Northeastern University, 2013.

Haynes, Jacqueline. "The Impact of the Small Learning Community Model on the Students, Teachers, Administrators, and the Overall Culture of High Schools." EdD diss., Jones International University, 2011.

Hladek, Mark Jon. "Breaking the Mold: Personalized Learning's Impact on the Development of Higher-Order Thinking Skills." EdD diss., University of South Carolina, 2018.

Kassabian, Narek Mardirosian. “Globalization in Curricular Elements and Instructional Practices in California Schools: A High School Case Study.” EdD diss., University of Southern California, 2011.

Mccarty, Terrell Dwayne. “Planning and Developing Advisory Programs for the Personalization of Education: A Handbook to Guide School Leaders of Large High Schools in Kansas.” EdD diss., Kansas State University, 2014.

McIntosh, Daniel Dean, II. “The Supplement of CompassLearning to Textbooks Meeting Cognitive Needs of Students: A Descriptive Case Study.” EdD diss., University of Phoenix, 2016.

Metcalf, Shelia Elaine. “Redesigning High School through a Personalized Learning Model.” EdD diss., William Woods University, 2017.

Mosier, Angela Dawn. “Teachers’ Challenges in Implementing Personalized Learning in Content Areas.” EdD diss., Walden University, 2018.

Netcoh, Steven. “Students’ Experience with Personalized Learning: An Examination Using Self-Determination Theory.” PhD diss., University of Vermont, 2018.

Palazzo, Renee. “Students’ Experiences in a Mathematics Intervention Program.” EdD diss., Northeastern University, 2013.

Pipkin, Tamika S. “Personalized Learning for the At-Risk through Intervention and Referral Services.” EdD diss., College of Saint Elizabeth, 2012.

Rollins, Joseph Ryan. “College and Career Ready through Personalized Learning: Business and Industry Perspective of the Don Tyson School of Innovation.” EdD diss., University of Arkansas, 2017.

Rutledge, Julia. “Measuring What Matters: How Noncognitive Skills Are Captured, Stored, and Utilized in Personalized Learning Environments.” PhD diss., University of Wisconsin – Madison, 2017.

Sampson, Elizabeth E. “The Perceptions of School Leaders Regarding the Efficacy of Small Learning Communities.” EdD diss., Lincoln Memorial University, 2012.

Savio-Ramos, Caroline Andrea. “A Study of the Self-Efficacy of Personalized Learning as a Remediation Tool in Algebra.” PhD diss., Arizona State University, 2015.

Shea, RoseEllen. “The Connection between Learning and Achievement of Gifted and Talented (GATE) High School Students Using a Personalized Learning Framework from the Perspective of High School Teachers.” EdD diss., Brandman University, 2019.

Thomas, Matthew Paul. “Personalized Learning: A Case Study of the Supporting Literature Applied to Practice and Implementation in a High School.” EdD diss., University of Pittsburgh, 2018.

Thompson, Kelly Ann. “The Lived Experiences of a Personalized Learning Approach on the Engagement and Literacy Development of Grade 12 Students Reading below Proficiency.” PhD diss., Cardinal Stritch University, 2019.

APPENDIX 2

LIST OF CODING CATEGORIES BY FREQUENCY
ORDER WITH SUBCATEGORIES

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Student Need	20	113
Student Centered	20	139
Technology	19	414
Adaptive	4	26
Technology Centers	1	1
Flexible Learning Settings or Environment	18	131
Leaving of Traditional Teaching Methods of Models	18	40
Student Interest Based Studies	17	116
Career Minded or Beyond Classroom Focus	17	116
Teacher Role	16	80
Student Choice	16	69
Individual Learning Plan or Personal Learning Paths	16	290
Student Directed Learning, Self-Directed, or Student Driven	16	82
Mastery Based or Competency Based	15	160
Teacher Development	15	106
Teacher Student Relationships	15	82
Student Led Pacing or Personalized Pacing	14	81
Learning Styles or Modalities	14	36
Blended Learning	12	173
Stakeholder's Involvement and Relationship	12	39
Community Involvement or Engagement	12	34
Collaboration Between Students	11	28

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Student Academic Goals	11	24
Project Based	11	48
Utilizing Data	10	70
Socio-Emotional Support	10	20
Student Ability Based	9	19
Student Self Regulation	9	21
Lower Teacher to Student Ratios	8	13
Personalized Assessment	8	14
Personalized Curriculum	8	14
Personalized Interventions	8	12
Multiple Types of Instruction	8	15
Teacher and Student Collaboration or Conferences	8	17
Student Engagement	8	21
Student Profiles	7	16
Individual Feedback	7	12
Based on State Standards and Set Curriculum	7	19
Student Ownership or Agency	7	26
Teacher Collaboration	6	9
Student Autonomy	6	68
Grouping	5	21
House Plan Model	1	2
Multiple Pathways to Graduation	5	20
Advisory	5	115
Transition Assistance	1	7
Academic Counseling	1	1
Small or Small Learning Communities	5	17
Differentiated Content	5	5
Scaffolding	5	10
Teacher to student academic Support	5	13
Student Voice	5	38
Well-Designed	4	9
Learning Portfolios	4	5
Student Reflection	4	5

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Cross Curricular integration or Interdisciplinary Approaches	4	8
Multiple Assignments or Assignment Modification	4	10
Student Control	4	9
Teacher Driven or Teacher-Directed	4	10
Personal Adult Advocate or Student Mentor	4	39
Student Responsibility	4	10
Student Self Motivation	4	16
Multiple intelligences	3	4
Student Strengths	3	11
Multiple Paths within a Classroom	3	4
Differentiated Pacing	3	3
Teacher Centered	3	5
Menus Individualized Learning Plan Menus	3	5
Independent Study	3	4
Rigor	3	4
Differentiated Instruction	3	5
Student Sense of Belonging	3	3
Critical Thinking	2	2
Flipped Instruction	2	5
Classroom Based Model	2	2
Student Maintained Data Tracking	2	2
Site and Situation Specific	2	7
Safe	2	2
Accountability	2	34
Teacher Choice	2	3
Student Weakness	2	4
Personalized Attention	2	4
Personalized Objectives	2	3
Guided Discovery	2	3
Student information	2	10
Diagnosis of Learner Characteristics	1	3

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Democratic Learning or Democratic approach	2	2
Work-Based Learning	2	2
Multiple Learning Options	2	2
Teacher Looping with Students	2	2
Teacher buy in	2	4
Teacher individual student teaching	2	4
Relevance of Information	2	3
Student Creativity	2	5
Student Preferences	2	3
Appropriate Challenges	2	4
Student to Student Relationship	2	2
Student Effort Based	1	1
Time Flexible	1	3
Student Led Conferences	1	3
High Expectations	1	1
Content Structure and Quality	1	2
Student Background	1	1
Alternative Forms of Grading	1	7
Classroom Redesign	1	1
Discipline	1	4
Measurable Results	1	2
Teacher Led Pacing	1	1
Module Driven	1	1
Multiple Courses within One Class	1	1
Teamwork	1	2
Adaptive to Individual Students	1	1
Independently Personalized	1	1
Planning for Learning Process	1	38
Micro-Level	1	1
Macro- Level	1	2
Best Knowledge on Learning Teaching	1	1
Self Contained	1	1
Student personality	1	1
Student Planned Curriculum	1	1

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Student Exploration	1	2
Self Sufficient	1	2
Growth Mindset	1	4
Contextualization	1	1
High School Advisory	1	3
Collegial School Culture	1	5
Teacher Attend Learning Readiness	1	2
Instructional Rate	1	1
Student maintained Planner	1	2
Student Value	1	4
Recognition of Accomplishments	1	1
Commitment	1	2
Student Problem-Centering	1	1
Multi-Media Product	1	1
Ubiquitous Access to Information	1	2
Intensity	1	2
Self Monitoring	1	4
Student Curiosity	1	2
Student Active Learning	1	2
Positive Learning Environment	1	1
Structures	1	1
Face to Face	1	1
Learning is engaging	1	1
Learning is meaningful	1	1
Student Support Teams	1	1
Student Competence	1	44
Traditional Coursework	1	3
Service-Learning	1	1
Dual Enrollment	1	1
Student Relatedness	1	28
Learning by Doing	1	1
Credits Based	1	1
Student Self Advocacy	1	4
Teacher Knowledge of Students	1	16
Foster Knowledge Building	1	1
Collective Responsibility	1	1

Elements of Personalized Learning	Number of Dissertations with References	Total Number of References
Communication	1	1
Culturally Relevant	1	5
Coaches	1	1
Inquiry Based Learning	1	5
Social Learning Theory	1	4
Critical Pedagogy	1	3
Student Self Organized	1	4
One on One	1	1

APPENDIX 3

LIST OF BENEFITS BY FREQUENCY ORDER
WITH SUBCATEGORIES

Benefits of Personalized Learning	Number of Dissertations with References	Total Number of References
Academic Achievement	19	61
Serves All Students	15	42
Increased Student Engagement	13	26
For at Risk, Underserved, or High Needs Students	12	48
School Reform	12	47
Student Motivation	12	42
Increase in Positive Perception of Education	7	20
College and Career Awareness, Success, Readiness	6	20
Affects Dropout	6	32
Increase Higher Order Thinking	5	36
Student Satisfaction	4	16
For Gifted Students	4	10
Behavior Improvements of Students	3	7
Used for Remediation	3	12
Increase in Teacher Student Relationships	3	3
Better Learning	3	6
Individualized Education	3	4
Lifelong Learners	3	3
Increase Psycho-Social Development	3	6
Equity	3	18
Increase Student Responsibility	2	2
Increased Teacher Knowledge of Students	2	2

Benefits of Personalized Learning	Number of Dissertations with References	Total Number of References
Accelerated Learning	2	2
Increase in Course Completion Rates	1	1
Increased Student Attention	1	1
Capitalize on Strengths as Learners	1	1
Increase Student Time on Task	1	1
Student Comfort with Academic Risk Taking	1	1
Increase Student Effort	1	1
Better than Traditional Learning Environments	1	1
Increased Efficiency	1	2
Close Gaps in Student Knowledge	1	1
Non-cognitive Skills Development	1	16
Student Persistence	1	2
Self-Management	1	2
Mindset	1	1
Content Mastery	1	1
Prepares Students for School Based Assessments	1	1
Positive School Climate	1	4
Improved Student Outcomes	1	1
Belonging to a Community	1	1
Improved Student Affect	1	1
Improved Well-Being	1	13
Beneficial Quality of Experience	1	1
Student Individuality	1	1

APPENDIX 4

DEFINITIONS CATEGORY: WORD FREQUENCY QUERY RESULTS

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
learning	8	116	8.11	learn, learning
students’	9	72	5.03	student, students, students’
personalized	12	65	4.54	personal, personalization, personalized, personalizing
instruction	11	35	2.45	instruction, instructional
needs	5	25	1.75	need, needs
interests	9	23	1.61	interest, interests
educators	9	21	1.47	educating, education, educational, educators
tailoring	9	19	1.33	tailor, tailored, tailoring
individual	10	18	1.26	individual, individualization, individualizing, individually
learners	8	17	1.19	learner, learners, learners’
approach	8	15	1.05	approach, approaches
environment	11	14	0.98	environment, environments
based	5	12	0.84	based
teachers	8	12	0.84	teacher, teachers

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
defined	7	11	0.77	define, defined, defines, defining
designed	8	11	0.77	design, designed, designing, designs
flexible	8	11	0.77	flexibility, flexible
school	6	11	0.77	school, schools
experiences	11	10	0.70	experience, experiences
model	5	10	0.70	model, models
plan	4	10	0.70	plan, plans
process	7	10	0.70	process
support	7	10	0.70	support, supports
centered	8	8	0.56	center, centered
goals	5	8	0.56	goals
ownership	9	8	0.56	ownership
technology	10	8	0.56	technology
content	7	7	0.49	content
provide	7	7	0.49	provide, providing
systems	7	7	0.49	system, systems
choice	6	6	0.42	choice, choices
create	6	6	0.42	create, created, creates, creating
develop	7	6	0.42	develop, development
mastery	7	6	0.42	mastery
meet	4	6	0.42	meet, meeting
pace	4	6	0.42	pace, paced
skills	6	6	0.42	skills
specific	8	6	0.42	specific, specifically
standards	9	6	0.42	standards
strengths	9	6	0.42	strengths
take	4	6	0.42	take
use	3	6	0.42	use, used, using
varied	6	6	0.42	varied, vary, varying
variety	7	6	0.42	variety

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
voice	5	6	0.42	voice
work	4	6	0.42	work
2014	4	5	0.35	2014
aspirations	11	5	0.35	aspirations
customized	10	5	0.35	customization, customized
increasing	10	5	0.35	increase, increasing, increasingly
practices	9	5	0.35	practice, practices
purposes	8	5	0.35	purpose, purposefully, purposes
toward	6	5	0.35	toward
within	6	5	0.35	within
2013	4	4	0.28	2013
according	9	4	0.28	accordance, according
achievement	11	4	0.28	achieve, achieved, achievement
allowing	8	4	0.28	allowing, allows
clark	5	4	0.28	clark, clarke
collaboratively	15	4	0.28	collaboration, collaborative, collaboratively
department	10	4	0.28	department
different	9	4	0.28	different
focus	5	4	0.28	focus, focused, focuses
help	4	4	0.28	help
including	9	4	0.28	including
incorporate	11	4	0.28	incorporate, incorporates, incorporating
knowledge	9	4	0.28	knowledge

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
leading	7	4	0.28	leading
level	5	4	0.28	level, levels
possible	8	4	0.28	possible
promote	7	4	0.28	promote, promotion
rather	6	4	0.28	rather
role	4	4	0.28	role
time	4	4	0.28	time, times
2010	4	3	0.21	2010
2016	4	3	0.21	2016
ability	7	3	0.21	abilities, ability
accelerate	10	3	0.21	accelerate
account	7	3	0.21	account, accounts
address	7	3	0.21	address, addresses
also	4	3	0.21	also
classroom	9	3	0.21	classroom
clear	5	3	0.21	clear, clearly
college	7	3	0.21	college
comprehensive	13	3	0.21	comprehensive
deepen	6	3	0.21	deepen
definition	10	3	0.21	definition
demonstrate	11	3	0.21	demonstrate
describes	9	3	0.21	described, describes
driven	6	3	0.21	driven
enabling	8	3	0.21	enabling
ensure	6	3	0.21	ensure
example	7	3	0.21	example, examples
guidance	8	3	0.21	guidance
high	4	3	0.21	high
highest	7	3	0.21	highest
holistic	8	3	0.21	holistic
integral	8	3	0.21	integral
maintain	8	3	0.21	maintain
managing	8	3	0.21	management, managing

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
mutually	8	3	0.21	mutual, mutually
name	4	3	0.21	name, namely
one	3	3	0.21	one
others	6	3	0.21	others
part	4	3	0.21	part
partnership	11	3	0.21	partnership
pathway	7	3	0.21	pathway, pathways
places	6	3	0.21	place, places
positioning	11	3	0.21	positioning, positions, posits
preferences	11	3	0.21	preferences, preferred
prepare	7	3	0.21	prepare
progression	11	3	0.21	progress, progression
receive	7	3	0.21	receive
relationships	13	3	0.21	relationship, relationships
requires	8	3	0.21	require, requires
research	8	3	0.21	research
rich	4	3	0.21	rich
similar	7	3	0.21	similar, similarly
sort	4	3	0.21	sort, sorted
structures	10	3	0.21	structured, structures
utilize	7	3	0.21	utilize, utilizes
whether	7	3	0.21	whether
2004	4	2	0.14	2004
2008	4	2	0.14	2008
2012	4	2	0.14	2012
activities	10	2	0.14	activities
adult	5	2	0.14	adult
advisors	8	2	0.14	advisors
agreed	6	2	0.14	agreed
assess	6	2	0.14	assess
available	9	2	0.14	available
become	6	2	0.14	become

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
benson	6	2	0.14	benson
beyond	6	2	0.14	beyond
blended	7	2	0.14	blended, blending
bmgf	4	2	0.14	bmgf
career	6	2	0.14	career
challenging	11	2	0.14	challenging
childress	9	2	0.14	childress
close	5	2	0.14	close
consider	8	2	0.14	consider, considered
cooperatively	13	2	0.14	cooperatively
curriculum	10	2	0.14	curriculum
differentiation	15	2	0.14	differentiation
direct	6	2	0.14	direct
emerges	7	2	0.14	emerges
encompasses	11	2	0.14	encompasses
engage	6	2	0.14	engage, engaging
expert	6	2	0.14	expert
explorations	12	2	0.14	explorations
field	5	2	0.14	field, fielding
forges	6	2	0.14	forges
glossary	8	2	0.14	glossary
group	5	2	0.14	group, groups
guides	6	2	0.14	guides
human	5	2	0.14	human
inherent	8	2	0.14	inherent, inherently
institute	9	2	0.14	institute
lesson	6	2	0.14	lesson, lessons
life	4	2	0.14	life
like	4	2	0.14	like
lists	5	2	0.14	lists
made	4	2	0.14	made
many	4	2	0.14	many
mass	4	2	0.14	mass
match	5	2	0.14	match

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
may	3	2	0.14	may
meaning	7	2	0.14	meaning, means
media	5	2	0.14	media
mentors	7	2	0.14	mentors
modern	6	2	0.14	modern
motivations	11	2	0.14	motivations
objective	9	2	0.14	objective, objectives
often	5	2	0.14	often
organized	9	2	0.14	organized, organizing
patrick	7	2	0.14	patrick
pedagogical	11	2	0.14	pedagogical
play	4	2	0.14	play
present	7	2	0.14	present
prior	5	2	0.14	prior
record	6	2	0.14	record
refers	6	2	0.14	refers
reform	6	2	0.14	reform
relevant	8	2	0.14	relevant
self	4	2	0.14	self
sizer	5	2	0.14	sizer
social	6	2	0.14	social
study	5	2	0.14	study
synonymous	10	2	0.14	synonymous
talents	7	2	0.14	talents
tasks	5	2	0.14	tasks
teaching	8	2	0.14	teaching
term	4	2	0.14	term, terms
theme	5	2	0.14	theme
traditional	11	2	0.14	traditional
wide	4	2	0.14	wide
1991	4	1	0.07	1991
2002	4	1	0.07	2002
2005	4	1	0.07	2005
2007	4	1	0.07	2007

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
2009	4	1	0.07	2009
2016b	5	1	0.07	2016b
2017	4	1	0.07	2017
21st	4	1	0.07	21st
abandon	7	1	0.07	abandon
academic	8	1	0.07	academic
accomplish	10	1	0.07	accomplish
add	3	1	0.07	add
addition	8	1	0.07	addition
adopted	7	1	0.07	adopted
advocacy	8	1	0.07	advocacy
aimed	5	1	0.07	aimed
alternative	11	1	0.07	alternative
alters	6	1	0.07	alters
although	8	1	0.07	although
amazon	6	1	0.07	amazon
anything	8	1	0.07	anything
approved	8	1	0.07	approved
around	6	1	0.07	around
assigned	8	1	0.07	assigned
atkins	6	1	0.07	atkins
atmosphere	10	1	0.07	atmosphere
attainment	10	1	0.07	attainment
attention	9	1	0.07	attention
authors	7	1	0.07	authors
autonomy	8	1	0.07	autonomy
basham	6	1	0.07	basham
belong	6	1	0.07	belong
best	4	1	0.07	best
beverages	9	1	0.07	beverages
boone	5	1	0.07	boone
bray	4	1	0.07	bray
breunlin	8	1	0.07	breunlin
brings	6	1	0.07	brings

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
broad	5	1	0.07	broad
brunello	8	1	0.07	brunello
build	5	1	0.07	build
call	4	1	0.07	call
capable	7	1	0.07	capable
caring	6	1	0.07	caring
ccsd	4	1	0.07	ccsd
century	7	1	0.07	century
characteristics	15	1	0.07	characteristics
characterized	13	1	0.07	characterized
checchi	7	1	0.07	checchi
cimmarusti	10	1	0.07	cimmarusti
cited	5	1	0.07	cited
class	5	1	0.07	class
cliché	6	1	0.07	cliché
coach	5	1	0.07	coach
coffee	6	1	0.07	coffee
collectively	12	1	0.07	collectively
combining	9	1	0.07	combining
communities	11	1	0.07	communities
competency	10	1	0.07	competency
compromise	10	1	0.07	compromise
computerized	12	1	0.07	computerized
computers	9	1	0.07	computers
consisting	10	1	0.07	consisting
constituting	12	1	0.07	constituting
constructors	12	1	0.07	constructors
contemporary	12	1	0.07	contemporary
control	7	1	0.07	control
core	4	1	0.07	core
course	6	1	0.07	course
creation	8	1	0.07	creation
criteria	8	1	0.07	criteria
data	4	1	0.07	data

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
delivery	8	1	0.07	delivery
demski	6	1	0.07	demski
detracking	10	1	0.07	detracking
dimartino	9	1	0.07	dimartino
discuss	7	1	0.07	discuss
distinct	8	1	0.07	distinct
dunne	5	1	0.07	dunne
edglossary	10	1	0.07	edglossary
effectively	11	1	0.07	effectively
effort	6	1	0.07	effort
either	6	1	0.07	either
electives	9	1	0.07	electives
emotional	9	1	0.07	emotional
empowered	9	1	0.07	empowered
enact	5	1	0.07	enact
encapsulate	11	1	0.07	encapsulate
ends	4	1	0.07	ends
enough	6	1	0.07	enough
entry	5	1	0.07	entry
enyedy	6	1	0.07	enyedy
etc	3	1	0.07	etc
every	5	1	0.07	every
factors	7	1	0.07	factors
fad	3	1	0.07	fad
famously	8	1	0.07	famously
fences	6	1	0.07	fences
final	5	1	0.07	final
followers	9	1	0.07	followers
former	6	1	0.07	former
formula	7	1	0.07	formula
fosters	7	1	0.07	fosters
foundation	10	1	0.07	foundation
framework	9	1	0.07	framework
free	4	1	0.07	free

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
freedom	7	1	0.07	freedom
fulfills	8	1	0.07	fulfills
furthermore	11	1	0.07	furthermore
gates	5	1	0.07	gates
grades	6	1	0.07	grades
gross	5	1	0.07	gross
grounded	8	1	0.07	grounded
growth	6	1	0.07	growth
horace	6	1	0.07	horace
hypothetical	12	1	0.07	hypothetical
idea	4	1	0.07	idea
identical	9	1	0.07	identical
implementation	14	1	0.07	implementation
implies	7	1	0.07	implies
industrial	10	1	0.07	industrial
infer	5	1	0.07	infer
information	11	1	0.07	information
initiated	9	1	0.07	initiated
intended	8	1	0.07	intended
interactions	12	1	0.07	interactions
intervention	12	1	0.07	intervention
involved	8	1	0.07	involved
irony	5	1	0.07	irony
itunes	6	1	0.07	itunes
jenkins	7	1	0.07	jenkins
keefe	5	1	0.07	keefe
kelly	5	1	0.07	kelly
kilgore	7	1	0.07	kilgore
kinds	5	1	0.07	kinds
lake	4	1	0.07	lake
last	4	1	0.07	last
leaner	6	1	0.07	leaner
least	5	1	0.07	least
lieber	6	1	0.07	lieber

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
lifestyle	9	1	0.07	lifestyle
long	4	1	0.07	long
make	4	1	0.07	make
mann	4	1	0.07	mann
mcclaskey	9	1	0.07	mcclaskey
mcgarvey	8	1	0.07	mcgarvey
meaningful	10	1	0.07	meaningful
measures	8	1	0.07	measures
methodology	11	1	0.07	methodology
miller	6	1	0.07	miller
mind	4	1	0.07	mind
mode	4	1	0.07	mode
multiple	8	1	0.07	multiple
music	5	1	0.07	music
must	4	1	0.07	must
national	8	1	0.07	national
negotiable	10	1	0.07	negotiable
netcoh	6	1	0.07	netcoh
netoch	6	1	0.07	netoch
non	3	1	0.07	non
nontraditional	14	1	0.07	nontraditional
noted	5	1	0.07	noted
novel	5	1	0.07	novel
oakes	5	1	0.07	oakes
offered	7	1	0.07	offered
optimized	9	1	0.07	optimized
org	3	1	0.07	org
originally	10	1	0.07	originally
outcomes	8	1	0.07	outcomes
output	6	1	0.07	output
outside	7	1	0.07	outside
pane	4	1	0.07	pane
para	4	1	0.07	para
paralleled	10	1	0.07	paralleled

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
parent	6	1	0.07	parent
paths	5	1	0.07	paths
pedagogy	8	1	0.07	pedagogy
people	6	1	0.07	people
per	3	1	0.07	per
performance	11	1	0.07	performance
phenomenon	10	1	0.07	phenomenon
physical	8	1	0.07	physical
platforms	9	1	0.07	platforms
playlists	9	1	0.07	playlists
points	6	1	0.07	points
policies	8	1	0.07	policies
practitioners	13	1	0.07	practitioners
preparatory	11	1	0.07	preparatory
prescribed	10	1	0.07	prescribed
primary	7	1	0.07	primary
producers	9	1	0.07	producers
products	8	1	0.07	products
proficiency	11	1	0.07	proficiency
profiles	8	1	0.07	profiles
program	7	1	0.07	program
psychological	13	1	0.07	psychological
pupils	6	1	0.07	pupils
pursue	6	1	0.07	pursue
readiness	9	1	0.07	readiness
recommends	10	1	0.07	recommends
redding	7	1	0.07	redding
rejected	8	1	0.07	rejected
relating	8	1	0.07	relating
repertoire	10	1	0.07	repertoire
replace	7	1	0.07	replace
resources	9	1	0.07	resources
respect	7	1	0.07	respect
responses	9	1	0.07	responses

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
restricted	10	1	0.07	restricted
result	6	1	0.07	result
review	6	1	0.07	review
rickabaugh	10	1	0.07	rickabaugh
rourke	6	1	0.07	rourke
saunders	8	1	0.07	saunders
schwan	6	1	0.07	schwan
scl	3	1	0.07	scl
secondary	9	1	0.07	secondary
seek	4	1	0.07	seek
selection	9	1	0.07	selection
sensibilities	13	1	0.07	sensibilities
sequencing	10	1	0.07	sequencing
serve	5	1	0.07	serve
services	8	1	0.07	services
set	3	1	0.07	set
shared	6	1	0.07	shared
shift	5	1	0.07	shift
shopping	8	1	0.07	shopping
short	5	1	0.07	short
since	5	1	0.07	since
small	5	1	0.07	small
spectrum	8	1	0.07	spectrum
spent	5	1	0.07	spent
starbucks	9	1	0.07	starbucks
states	6	1	0.07	states
strategies	10	1	0.07	strategies
streams	7	1	0.07	streams
studentdirected	15	1	0.07	studentdirected
style	5	1	0.07	style
success	7	1	0.07	success
techniques	10	1	0.07	techniques
ted	3	1	0.07	ted
theoretical	11	1	0.07	theoretical

Word	Word Length	Count	Weighted Percentage (%)	Similar Words
things	6	1	0.07	things
thought	7	1	0.07	thought
three	5	1	0.07	three
thus	4	1	0.07	thus
together	8	1	0.07	together
tools	5	1	0.07	tools
topical	7	1	0.07	topical
tracked	7	1	0.07	tracked
trajectories	12	1	0.07	trajectories
treatment	9	1	0.07	treatment
trust	5	1	0.07	trust
twyman	6	1	0.07	twyman
type	4	1	0.07	type
ultimately	10	1	0.07	ultimately
united	6	1	0.07	united
usually	7	1	0.07	usually
value	5	1	0.07	value
version	7	1	0.07	version
virtually	9	1	0.07	virtually
vision	6	1	0.07	vision
vocational	10	1	0.07	vocational
ways	4	1	0.07	ways
whereby	7	1	0.07	whereby
wish	4	1	0.07	wish
word	4	1	0.07	word
writes	6	1	0.07	writes

APPENDIX 5

WORD CLOUD VISUALIZATION

Figure A1. Word cloud visualization of most commonly used words in definitions of personalized learning

APPENDIX 6

RUBRIC FOR IDENTIFYING ELEMENTS IN A MODEL OF PERSONALIZED LEARNING

See the following pages.

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the PL model in question have a focus on meeting *Student Need?* (1)	Student needs are met in remedial learning opportunities.	Student needs, academic and other wise, are considered and teachers adjust learning because of them.	Student needs, in many areas of a student's life, are considered and change the teaching and learning approaches.			
Is the PL model *Student Centered?* (Friendly to students, As opposed to a Teacher Centered) (1)	The model is lacking a complete student centeredness.	Students are considered first when learning is planned for in the classroom.	Students are considered first in the classroom and in the administration's choices.			
Does the PL Model incorporate *Technology*? (Please add in the Notes section how the model uses technology.) (2)	Technology opportunities exist, however they are not incorporated as PL opportunities.	Technology is used to support PL.	Technology is made accessible and seamlessly incorporated in this model of PL.			
Does the model of PL *Flexible Learning Settings or Environments?* (If so, please indicate where a majority of the learning will occur.) (3)	Some flexibility in learning settings are available within the classroom.	Learning settings exist in and outside the classroom.	Learning settings and environments exist in the classroom, outside the classroom, and outside the school.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Are a majority of elements of *Traditional Teaching Methods or Models Not included* in the PL model? (Please indicate what traditional teaching methods are maintained in the notes.) (3)	There are some traditional teaching methods still existent in the school.	Classroom level instruction includes some of the following: seat time, one size fits all, grading systems, teacher's roles, or beyond differentiated instruction.	Schoolwide and Classroom Level includes a change in traditional teaching methods or models.			
Are *Student Interest Based Studies* available for students? (Please indicate how student interested are included in the notes.) (4)	Some interest based studies, like elective classes, are evident in the model of PL. On a classroom level, an interest survey is used, but does not change the material to be studied.	Interest Based studies are existent in the classroom. Student's curriculum is changed by their interests.	Interest Based studies are available at the school-level and classroom level.			
Is the model of PL incorporate opportunities for a *Career Minded or Beyond Classroom Focus* Learning? (Please indicate *how* in the notes.) (4)	The model has some manufactured opportunities and focus on the beyond classroom setting.	The model has several real-life opportunities for students to experience careers of interest and a focus on life beyond the classroom exists.	The model has several real-life opportunities for students to experience careers of interest and a focus on life beyond the classroom exists. These are seamlessly incorporated to the school and classroom.			
Does the model of PL include training opportunities, and a shift in *Teacher Role*? (Please describe the role of the teacher identified in the model of PL.) (5)	Some features of a shift in teacher role are discussed and presented in the classroom. However a clear plan of implementation is not presented.	Many features of a shift in teacher role are discussed and presented. A clear plan of implementation is also presented.	Many features of a shift in teacher role are discussed and presented. A clear plan of implementation is also presented along with schoolwide training of redefining teacher roles.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does this model of PL include *Student Choice*? (Please indicate how in the notes.) (5)	Some student choice options exist in the model of PL, however there is limited information about what choices should be offered.	Student choice is outlined and planned for. The model has clear usable examples of student choice ideas in the class.	Student choice is outlined and planned for. The model has clear usable examples of student choice ideas in the class and in the schoolwide plan.			
Does this model of PL *Individual Learning Plan or Personal Learning Paths*? (Please indicate how in the notes.) (5)	There are some useful details concerning a personalized learning path.	A clear personalized learning path is outlined in the classroom.	A clear personalized learning path is present for all the classrooms and in a schoolwide model.			
Does this model of PL contain *Student Directed Learning, Self-Directed, or Student Driven Learning*? (Please indicate how in the notes.) (5)	Student directed learning is a feature of the plan. There is some direction on how to incorporate it in the classroom.	Student directed learning is key feature of the plan. There are good indications of how to incorporate this feature into the classroom.	Student directed learning is a key feature in the school and classroom. Good clear examples of how to incorporate it are given.			
Does this model of PL contain *Mastery Based or Competency Based* grading? (6)	The model of PL contains a plan for master based learning. However it is lacking in features and details.	The model of PL contains a clear way to incorporate mastery based learning within the classroom.	Mastery based learning is incorporated seamlessly into the model of PL in the classroom and schoolwide.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the PL model include *Teacher Development*? (Please indicate how in the notes.) (6)	Teacher development is mentioned in the model of PL. An incomplete plan for teacher development is given.	Teacher development is a strong incorporation of the model of PL. The plan contains clear routes for contents of teacher development.	Teacher development is a strong feature of the model of PL. It contains clear routes for training teachers on PL and has measures included to test its effectiveness.			
Does the PL model emphasize *Teacher Student Relationships*? (6)	Teacher student relationships are a feature of the plan, however there is no actionable plan for increasing them given.	Teacher student relationships are a given emphasis in the model of PL. A plan for starting, increasing, and maintaining relationships in the classroom is given.	Teacher student relationships are a given emphasis in the model of PL. A plan for starting, increasing, and maintaining relationships in the classroom and in the school are given.			
Does the PL model involve *Student Led Pacing or Personalized Pacing*? (If so, indicate how in the notes.) (7)	Student led pacing is described with some applicable ideas for usage.	Student led pacing is a feature of this model of PL. It is well described and contains a plan.	Student led pacing is well defined, planned for, and implemented schoolwide.			
Does the model of PL take into consideration *Learning Styles or Modalities* of students? (Please indicate how in the notes.) (7)	Student Learning styles are a feature of this model of PL. Yet the incorporation of learning styles into the model of PL is lacking.	Student Learning styles are a key feature of this model of PL. Clear recognition and a plan for incorporation exists.	Student Learning styles are planned for and incorporated in this model of PL. There are schoolwide supports and learning style are seamlessly integrated.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the model of PL include *Blended Learning*? (8)	Blended learning is a feature of this model of PL. Some aspects exist, however no clear implementation and usage is given.	Blended learning is a key feature of this model of PL. There are clear definitions given along with a good plan for implementation in the model of PL.	Blended learning is seamlessly integrated into the model of PL in the classroom and is supported schoolwide. A plan and tips exists for schoolwide implementation			
Are *Stakeholder's Involvement and Relationship* included in the model of PL? (8)	Stakeholder involvement is mentioned but no plan for implementation is given in this model of PL.	Stakeholder involvement is planned for in the model of PL. Ideas and implementations are set in the classroom.	Stakeholder involvement is planned for in the classroom and in the schoolwide plan for personalization.			
Does the model of PL include *Community Involvement or Engagement*? (Please indicate how in the notes.) (8)	Community involvement is somewhat planned for in the model of PL but the plan is lacking.	Community involvement is planned for in the model of PL. Plans for implementation are given for the classroom setting.	Community involvement is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the model of PL account for *Collaboration Between Students*? (If so, please indicate how in the notes.) (9)	Collaboration between students is somewhat planned for in the model of PL but the plan is lacking.	Collaboration between students is planned for in the model of PL. Plans for implementation are given for the classroom setting.	Collaboration between students is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the model of PL include *Student Academic Goals* in its design process? (9)	Student academic goals is somewhat planned for in the model of PL but the plan is lacking.	Student academic goals are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student academic is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the PL model have *Project Based* assignments? (9)	Project based assignments are somewhat planned for in the model of PL but the plan is lacking.	Project based assignments are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Project based assignments are well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the model of PL *Utilize Data* in planning for student learning? (10)	The model of PL suggests utilizing data but a clear plan is lacking.	Utilizing data is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Utilizing data is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the model of PL offer students *Socio-Emotional Support*? (10)	Socio-emotional support is somewhat planned for in the model of PL but the plan is lacking.	Socio-emotional support is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Socio-emotional support is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the model of PL contain *Student Ability Based* learning? (11)	Student ability based learning is somewhat planned for in the model of PL but the plan is lacking.	Student ability support is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student ability support is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the model of PL have *Student Self Regulation*? (11)	Student self regulation is somewhat planned for in the model of PL but the plan is lacking.	Student self regulation is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student self regulation is well planned for in the classroom and the school. The ideas are seamlessly integrated into the model of PL.			
Does the model of PL contain *Lower Teacher to Student Ratios*? (12)	Lower teacher to student ratios are somewhat planned for in the model of PL but the plan is lacking.	Lower teacher to student ratios are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Lower teacher to student ratios are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Does the model of PL account for *Personalized Assessment*? (12)	Personalized Assessment is somewhat planned for in the model of PL but the plan is lacking.	Personalized Assessment is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Personalized Assessment is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Does the model of PL have *Personalized Curriculum* as a feature? (12)	Personalized curriculum is somewhat planned for in the model of PL but the plan is lacking.	Personalized curriculum is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Personalized curriculum is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Are *Personalized Interventions* included in this model of PL? (If so, indicate the plan for this in the notes.) (12)	Personalized interventions are somewhat planned for in the model of PL but the plan is lacking.	Personalized interventions are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Personalized interventions are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Are *Multiple Types of Instruction* being offered to students in this model of PL? (12)	Multiple types of instruction are somewhat planned for in the model of PL but the plan is lacking.	Multiple types of instruction are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Multiple types of instruction are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Are *Teacher and Student Collaboration or Conferences* offered in this model of PL? (12)	Teacher and student collaboration is somewhat planned for in the model of PL but the plan is lacking.	Teacher and student collaboration is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Teacher student collaboration is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Is *Student Engagement* being accounted for in this model of PL? (12)	Student engagement is somewhat planned for in the model of PL but the plan is lacking.	Student engagement is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student engagement is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Are *Student Profiles* being utilized for learning? (13)	Student profiles are somewhat planned for in the model of PL but the plan is lacking.	Student profiles are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student profiles are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Is *Individual Feedback* incorporated for these students? (13)	Individual feedback is somewhat planned for in the model of PL but the plan is lacking.	Individual feedback is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Individual Feedback is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			
Are learning opportunities *Based on State Standards and Set Curriculum*? (If so, indicate which curriculum in the notes.) (13)	Learning opportunities based on state standards and set curriculum are somewhat planned for in the model of PL but the plan is lacking.	Learning opportunities based on state standards and set curriculum are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Learning opportunities based on state standards and set curriculum are a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			

Element of Personalized Learning (Rank of Prevalence)	2 - Some Features Are Evident	3 - Element Is Well-Planned for in the Class	4 - Element Contains Excellent Qualities in the Class and in Schoolwide Implementations	Total	Notes	How can you improve or tailor the element to fit your educational setting?
Is *Student Ownership or Agency* directly encouraged in this model of PL? (If so, indicate how in the notes.) (13)	Student ownership is somewhat planned for in the model of PL but the plan is lacking.	Student ownership is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom setting.	Student ownership is a feature of the model of PL. Comprehensive plans for implementation are given for the classroom and schoolwide setting with alternative options.			

APPENDIX 7

A RUBRIC FOR IDENTIFYING BENEFITS OF PERSONALIZED LEARNING

Benefits of Personalized Learning (PL)	Yes	No	Evidence	Notes
Was *Academic Achievement* an evident benefit for this model of PL? (1)				
Did this model of PL *Serve All Students* (i.e., students from various cultures, academic backgrounds, and socio-economic statuses)? (2)				
Was there an *Increased Student Engagement* with this model of PL? (3)				
Were students identified in *At Risk*, *Underserved*, *or High Needs Students* categories better served by this model of PL? (4)				
Did this model of PL aid *School Reform?* (4)				
Was there an increase in *Student Motivation* in the classroom and/or the school? (4)				
Did students demonstrate an *Increase in Positive Perception of Education*? (5)				

BIBLIOGRAPHY

Allison, Gregg R. "Humanity, Sin, and Christian Education." In *A Theology for Christian Education*, by James R. Estep Jr., Michael J. Anthony, and Gregg R. Allison, 174–99. Nashville: B & H Academic, 2008.

Barrett, Dustin Dale. "A Mixed Methods Study to Measure the Impact of Mastery-Based, Personalized Learning on At-Risk Student Achievement." PhD diss., Northwest Nazarene University, 2017.

Beese, Elizabeth Brott. "How Do They Do It? Describing Nontraditional Designs for Creating and Carrying Out Personalized Plans for Learning in Three High Schools." PhD diss., Purdue University, 2018.

Bloom, Benjamin S. "The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring." *Educational Researcher* 13, no. 6 (July 1984): 4–16.

Bloom, Benjamin S., David R. Krathwolhl, and Bertram B. Masia. *Taxonomy of Educational Objectives: The Classification of Educational Goals*. Vol. 2, *Affective Domain*. New York: David McKay, 1969.

Carroll, J. B. "A Model of School Learning." *Teachers College Record* 64 (1963): 723–33.

Clark, John-Patrick G. "Engagement's Mediation of the Relationship between Personalized Learning and Achievement." EdD diss., Western Kentucky University, 2017.

Clarke, John. "Personalized Learning and Personalized Teaching." In *Personalized Learning: Preparing High School Students to Create Their Futures*, edited by Joseph DiMartino, John Clarke, and Denise Wolk, 69–86. Lanham, MD: Scarecrow Education Press, 2003.

Clarke, John, and Edorah Frazer. "Making Learning Personal: Educational Practices That Work." In *Personalized Learning: Preparing High School Students to Create Their Futures*, edited by Joseph DiMartino and Denise Wolk, 173–94. Lanham, MD: Scarecrow Education Press, 2003.

Darling-Hammond, Linda, Jacqueline Ancess, and Susanna Wichterle Ort. "Reinventing High School: Outcomes of the Coalition Campus Schools Project." *American Educational Research Journal* 39, no. 3 (January 2002): 639–73.

DiMartino, Joseph, and John H. Clarke. *Personalizing the High School Experience for Each Student*. Alexandria, VA: Association for Supervision and Curriculum Development, 2008.

DiMartino, Joseph, John Clarke, and Denise Wolk, eds. *Personalized Learning: Preparing High School Students to Create Their Futures*. Lanham, MD: Scarecrow Education Press, 2003.

Eiken, Odd. "The Kunskapsskolan ('the Knowledge School'): A Personalised Approach to Education." *CELE Exchange* 2011, no. 1 (April 2011): 1–4.

Erickson, Millard J. *Christian Theology*. Grand Rapids: Baker Academic, 2013.

Estep, James Riley, Jr., Michael J. Anthony, and Gregg R. Allison. *A Theology for Christian Education*. Nashville: B & H Academic, 2008.

Estep, James Riley, Jr., and Jonathan H Kim. *Christian Formation: Integrating Theology and Human Development*. Nashville: B & H Academic, 2010.

Ferguson, Dianne L., Ginevra Ralph, Gwen Meyer, Jackie Lester, Cleo Droege, Hafdis Guojonsdottir, Nadia Katul Sampson, and Janet Williams. *Designing Personalized Learning for Every Student*. Alexandria, VA: Association for Supervision and Curriculum Development, 2001.

Freitas, Sara de. "The Paradox of Choice and Personalization." In *Personalizing Learning in the 21st Century*, edited by Sara de Freitas and Chris Yapp, 13–16. Stafford, UK: Network Educational Press, 2005.

Garcia-Delmuro, Ces'Ari Racine. "Teacher Experience with Personalized Learning: Training, Program Elements, and Teacher Role at Two Low SES Schools." EdD diss., University of California, Los Angeles, 2019.

Gentry, Peter J., and Stephen J. Wellum. *Kingdom through Covenant: A Biblical-Theological Understanding of the Covenants*. 2nd ed. Wheaton, IL: Crossway, 2018.

Hsieh, Hsiu-Fang, and Sarah E. Shannon. "Three Approaches to Qualitative Content Analysis." *Qualitative Health Research* 15, no. 9 (November 2005): 1277–88.

Joshi, Shubham, Radha Krishna Rambola, and Prathamesh Churi. "Evaluating Artificial Intelligence in Education for Next Generation." *Journal of Physics, Conference Series* 1714, no. 1 (2021): 1–13.

Keller, Fred S., and J. Gilmour Sherman. *The Keller Plan Handbook*. Menlo Park, CA: W. A. Benjamin, 1974.

Krippendorff, Klaus. *Content Analysis: An Introduction to Its Methodology*. 2nd ed. Thousand Oaks, CA: Sage, 2004.

Kulik, James A., Chen-lin C. Kulik, and Peter A. Cohen. "A Meta-Analysis of Outcome Studies of Keller's Personalized System of Instruction." *American Psychologist* 34, no. 4 (April 1979): 307–18.

Leedy, Paul D., and Jeanne Ellis Ormrod. *Practical Research Planning and Design*. 11th ed. New York: Pearson, 2016.

Levitt, Heidi M. “How to Conduct a Qualitative Meta-Analysis: Tailoring Methods to Enhance Methodological Integrity.” *Psychotherapy Research* 28, no. 3 (May 2018): 367–78.

Lipsey, Mark W., and David B. Wilson. *Practical Meta-Analysis*. Thousand Oaks, CA: Sage, 2001.

National Association of Secondary School Principals. *Breaking Ranks II: Strategies for Leading High School Reform*. N.p.: National Association of Secondary School Principals, 2004.

Neuzil, Andrea Yeager. “Equitable Student Engagement: A Correlation between Personalized Learning, Student Engagement, and Poverty Level.” EdD diss., University of Nebraska at Omaha, 2016.

Noblit, George W., and R. Dwight Hare. *Meta-Ethnography: Synthesizing Qualitative Studies*. Qualitative Research Methods 11. Thousand Oaks, CA: Sage, 1988.

Pane, John F. “Strategies for Implementing Personalized Learning While Evidence and Resources Are Underdeveloped.” Santa Monica, CA: RAND, 2018. https://www.rand.org/pubs/perspectives/PE314.html

Pane, John F., Elizabeth D. Steiner, Matthew D. Baird, Laura S. Hamilton, and Joseph D. Pane. “Informing Progress: Insights on Personalized Learning Implementation and Effects.” Santa Monica, CA: RAND, 2017. https://www.rand.org/pubs/research_reports/RR2042.html.

Plantinga, Alvin, and Michael Tooley. *Knowledge of God*. Malden, MA: Blackwell, 2008.

Rousseau, Jean-Jacques. *Emile or On Education*. New York: Basic Books, 1979.

Sereno, Michael A. “The Impact of a Personalized Learning Framework on Student Achievement.” Edd diss., Edgewood College, 2018.

Steiner, Elizabeth, Laura Hamilton, Laura Stelitano, and Mollie Rudnick. *Designing Innovative High Schools: Implementation of the Opportunity by Design Initiative after Two Years*. Santa Monica, CA: RAND, 2017. https://www.rand.org/pubs/research_reports/RR2005.html

Thomas, Matthew Paul. “Personalized Learning: A Case Study of Supporting Literature Applied to Practice and Implementation in a High School.” Edd diss., University of Pittsburgh, 2018.

Walter, Scott. “The ‘Flawed Parent’: A Reconsideration of Rousseau’s ‘Emile’ and Its Significance for Radical Education in the United States.” *British Journal of Educational Studies* 44, no. 3 (1996): 260–74.

Ware, Bruce A. *The Man Christ Jesus: Theological Reflections on the Humanity of Christ*. Wheaton, IL: Crossway, 2013.

Watters, Audrey. “The Histories of Personalized Learning.” Hack Education, June 9, 2017. http://hackeducation.com/2017/06/09/personalization.

Wayne A. Grudem. *Systematic Theology: An Introduction to Biblical Doctrine*. Grand Rapids: Zondervan, 2000.

Wise, Derek. “Personalized Learning: Personalized Schooling.” In *Personalizing Learning in the 21st Century*, edited by Sara de Freitas and Chris Yapp, 47–52. Stafford, UK: Network Educational Press, 2005.

Wolfson, Bernice J. “The Educational Scene.” *Elementary English* 40 (April 1963): 456–560.

Zmuda, Allison, Diane Ullman, and Greg Curtis. *Learning Personalized: The Evolution of the Contemporary Classroom*. San Francisco, CA: Jossey-Bass, 2015.

ABSTRACT

PERSONALIZED LEARNING: A META-ANALYSIS

David Alex Ogle, EdD
The Southern Baptist Theological Seminary, 2021
Chair: Dr. Anthony Foster

Personalized learning has no agreed upon definition, models, or systemization of how to employ it. There is even variation in concerning its benefits. This research attempts build an understanding of personalized learning based on the existent literature. Using qualitative content analysis methods, dissertations from the past ten years were selected, narrowed down, and analyzed using *NVivo 12*. The findings will prompt a further understanding of personalized learning and give school systems a place to start when attempting an implementation plan.

VITA

David Alex Ogle

EDUCATION

BA, Tennessee Technological University, 2007
MA, Western Governor's University, Tennessee, 2017

EMPLOYMENT

English Teacher Middle School, Athens City Schools, Knoxville, Tennessee, 2010–2012
English Language Learner Teacher, Central High School, Knoxville, Tennessee, 2014–2018
Parent Outreach Coordinator, Tennessee Schools for the Deaf, Knoxville, Tennessee, 2018–

MINISTERIAL EMPLOYMENT

Missionary/Tutor, Campus Outreach International, Belo-Horizonte, Brazil, 2007