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Richard Thrupp  
*University of Central Florida*

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A SURVEY OF INVESTING AND RETIREMENT KNOWLEDGE  
AND PREFERENCES OF FLORIDA PRESERVICE TEACHERS

by

RICHARD THRIPP

B. S. University of Central Florida, 2014

M. A. University of Central Florida, 2016

A dissertation submitted in partial fulfillment of the requirements  
for the degree of Doctor of Philosophy in Education  
in the Department of Learning Sciences and Educational Research  
in the College of Community Innovation and Education  
at the University of Central Florida  
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Major Professor: C. Richard Hartshorne

## ABSTRACT

New teachers are facing lower pay and less generous retirement benefits than the prior generation, yet their financial and retirement knowledge, concerns, and preferences have received little attention. To investigate these areas, the author developed a 39-item survey instrument and administered it to 314 preservice teachers in undergraduate teacher education courses at the University of Central Florida, who were primarily female elementary and early childhood education juniors and seniors ages 18–25. Florida public employees are offered an unusual choice between a traditional pension plan and a defined-contribution plan similar to a 401(k) in which they can select their own investments, and 54% of surveyed preservice teachers preferred the 401(k)-like plan structure. However, their preferences may be ill-advised, given that in a mock portfolio allocation exercise intended to assess retirement investing sophistication, preservice teachers directed more than half their retirement money to low-risk money market and bond funds, which will likely underperform stocks over several decades. Furthermore, they anticipated that low salaries will impede their ability to save for retirement. For comparison, the survey was also administered to 205 U.S. college students or graduates ages 18–25 on the Amazon Mechanical Turk platform for \$1.00 each. Worryingly, preservice teachers had significantly lower financial knowledge and retirement investing sophistication. These findings suggest a need for financial education targeting Florida preservice teachers, particularly given that the Florida Retirement System substantially cut its benefits in 2011.

*Keywords:* financial literacy, preservice teachers, Florida Retirement System, retirement knowledge, financial challenges, plan preferences, investor behavior, nonwage benefits

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## CHAPTER ONE: INTRODUCTION

Preservice teachers have selected their majors for some combination of altruistic and instrumental purposes. On the one hand, the love of teaching, working with children or youths, and building knowledge and interest in scholarship are primarily or at least substantially altruistic motivations (Serow, 1993). On the other hand, teaching is a career that pays the bills and offers some level of job security. Although preservice teacher support and teacher compensation in the United States are low when compared with other countries (Darling-Hammond, 2017; Hong, 2012), the benefit of receiving a sizable pension in retirement remains a key part of total compensation (Costrell & Podgursky, 2009b), and is frequently cited as an inducement toward teacher recruitment and retention at the district and state levels (Boivie, 2017; Kimball, Heneman, & Kellor, 2005). However, this common conception may be incorrect, because the small amount of available research shows limited understanding of retirement plans among preservice teachers (Lucey, Meyers, & Smith, 2017; Lucey & Norton, 2011).

Lucey and Norton (2011) conducted a survey of Illinois preservice teachers' knowledge of retirement concepts, finding an overwhelming lack of knowledge among participants regarding basic retirement plan terminology such as defined benefit (DB) and defined contribution (DC) plans, vesting periods, and plan fees. Regrettably, fewer than one-fourth of participants indicated a "good" or "complete" knowledge of basic financial products such as "investments," "stocks," "bonds," "mutual funds," or annuities. This aligns with a long history of inquiry into teachers' knowledge of economics, both pre- and in-service, which has shown a lack of knowledge of both basic and complex economic concepts (Bosshardt & Watts, 1990; Grimes, Millea, & Thomas, 2010; Lynch, 1990; McKenzie, 1971; McKinney, Larkins, McKinney,

Gilmore, & Ford, 1990; Walstad & Soper, 1988; Wetzel, O'Toole, & Millner, 1991). Although teachers' knowledge of retirement, personal finance, and economics is wanting, educational courses and workshops have produced improvements in understanding and knowledge (Harter & Harter, 2012; Lucey et al., 2017; Swinton, De Berry, Scafidi, & Woodard, 2010). This occurs not only for teachers, but also for their students, perhaps because teachers incorporate their new knowledge into their teaching practices (Harter & Harter, 2012; Lucey, 2016; Riley, 2015).

Teachers are often presumed to understand retirement planning and be incentivized by retirement benefits—most commonly, pension plans. This idea, that pensions function as a recruitment tool or even a retention tool, is in fact, questionable. Chan and Stevens (2008) found that many individuals, including teachers, are ill-informed about their pension plans and consequently make poor retirement timing decisions. Although Kimball et al. (2005) set out to make a case for pensions as a recruitment tool, they admitted that higher salary is more effective than equivalent pension benefits. Most shockingly, Fitzpatrick (2015) studied the quantitative value that in-service teachers place on their pension benefits, finding that teachers are only willing to pay 20¢ on the dollar for pension benefits. Of course, such a steep delay discount—that is, valuing a benefit that will not be received until a future time much less than current money (Sourdin, 2008)—is foolish. It suggests that teachers neither understand nor appropriately value their retirement benefits.

A downside of pension benefits, which are received as part of a DB plan as a fixed or inflation-adjusted monthly sum for life during retirement, is that one must work as a teacher in a particular state for many years to receive them. They discourage mobility and do not provide the flexibility of 401(k)-style accounts (Hansen, 2008, 2010). For teachers who work 20–30 years or longer in the same state, they generally provide better benefits than a DC plan (e.g., 401[k],



403[b]), and this is frequently cited as rationale for both their value to career teachers *and* presumed overwhelming popularity among teachers (Morrissey, 2017; see also Boivie, 2017; Rhee & Joyner, 2019). However, several states have been moving toward DC plans (Snell, 2012), with Florida being the largest by population of a handful of states that offer both DB and DC options. The assumption that teachers overwhelmingly prefer pension plans has not been borne out in the data; Chingos and West (2015) found that one-fourth to one-third of new Florida teachers select the DC plan, and Goldhaber and Grout (2016) report that newer teachers are more likely than veteran teachers to prefer DC plans.

Little research has been done on the retirement knowledge, preferences, or concerns of preservice teachers, who are enrolled in education programs to become schoolteachers. This lack of research also extends to financial literacy at a broader level, beyond retirement planning. Of concern is that new teachers may be ill-prepared for a changing landscape where teachers' retirement security is being eroded and increasingly requires financial and investing expertise and discipline on the part of teachers (Rhee, 2013; Rhee & Joyner, 2019). In the bigger picture, a lack of financial acumen among teachers negatively impacts both their financial security and their ability to teach financial skills to the next generation (Way & Holden, 2009), which is of particular concern in light of the unprecedented student loan debt that Millennials and Generation Z are facing (Montalto, Phillips, McDaniel, & Baker, 2019; Scott-Clayton, 2018).

### **Statement of Problem**

There has been scant research on preservice teachers' understanding of retirement plans and other financial concepts (Lucey & Norton, 2011). Teachers attitudes and preferences toward different types of retirement plans have received little attention, which is paradoxical as large and potentially detrimental changes are being implemented to state retirement plans across the

country, with little to no input from teachers (Rhee & Joyner, 2019; Snell, 2012). Surveying preservice teachers on these matters can offer insight into their perspectives, knowledge, and preferences, while also informing educational efforts from plan sponsors and others, targeted toward gaps in participants' knowledge so as to support their financial success and retirement security. This is of special importance in states such as Florida, which offer employees a choice between a DB and DC retirement plan, and will provide additional evidence regarding the value of pensions as a recruitment incentive (cf. Fitzpatrick, 2015). Although retirement benefits are a significant part of teachers' total compensation and are touted as aiding recruitment and retention (Boivie, 2017), it is difficult to quantify them as such without research on teacher knowledge and preferences, which could also guide employers and legislators in modifying retirement programs and educating plan participants. For example, if teachers prefer higher salaries, states could offer higher salaries and Social Security in lieu of an independent retirement program.

Kimball et al. (2005) propose that pensions are only effective as employment incentives if teachers are educated about them, which frequently they are not (Chalmers, Johnson, & Reuter, 2014). Another problem is that teachers are likely to face low income in retirement due to relatively low salaries leading to low monthly or accumulated benefits, and about 40% will not receive Social Security (Rhee & Joyner, 2019), because their states choose not to participate in Social Security contributions for their employees (e.g., California, Louisiana, and Massachusetts), which makes employees far more reliant on employer retirement programs. However, states that participate in Social Security, such as Florida, offer lower pension benefits. Therefore, it is essential to teachers' lifelong financial wellness that their financial knowledge be studied and addressed. Even assuming that teachers will retire at an appropriate time may be an erroneous assumption; Chan and Stevens (2008) find that many individuals misunderstand their

pension plans and as a consequence, retire at the wrong time. Teachers' financial literacy becomes more important due to a lack of state dollars flowing into pension plans—many states are now offering DC plans with few guarantees of retirement income, and some are scaling back or phasing out DB plans (Ali & Frank, 2019; Rhee & Joyner, 2019; Snell, 2012). This means the burden to direct one's investments and refrain from making early or lump-sum withdrawals now falls, in many instances, on teachers, who are also disadvantaged when investing on an individual basis as compared with the advantages of risk pooling available to pension funds, which allow for aggressive investing and consistently higher returns (Rhee & Joyner, 2019). The majority of plan participants perform poorly in DC plans (Rhee & Joyner, 2019), and in Florida, which offers a DB–DC choice, the state contributes much less to one's retirement if choosing the DC option (3.3% instead of 6.2%; Florida Division of Retirement, 2017, 2018). Taken together, these factors result in greater financial peril for the next generation of teachers in retirement, which necessitates attention and research.

Florida has the fourth largest retirement system in the United States, with assets of \$161 billion as of the end of the 2017–2018 fiscal year (Florida Division of Retirement, 2018). Since 2001, Florida has offered public workers a choice between a DB (pension) plan and a DC plan similar to a 401(k), and is the largest, by population of public workers, of seven states that do so (Brown & Larrabee, 2017). Therefore, studying preservice teachers in Florida is a unique opportunity, because these students will soon be faced with a choice between a DB and DC plan if they go on to teach in Florida. In this dissertation, I developed and administered a survey to 314 preservice teachers at University of Central Florida (UCF) toward these ends. UCF is a large, urban, diverse institution with 1,994 preservice teachers enrolled as of Fall 2018, of which 59% are majoring in elementary education (UCF, 2016, 2019a, 2019b, 2019c).

To compare the financial knowledge and attitudes of preservice teachers to an age-matched sample in the general public (Buhrmester, Kwang, & Gosling, 2011), I surveyed a comparison group using Amazon Mechanical Turk (MTurk) of American adults ages 18 to 25. MTurk is a “crowdsourcing” platform where workers complete surveys and other tasks for pay, and has been found to produce valid and representative data (Casler, Bickel, & Hackett, 2013). Because I developed new questions in my survey, the MTurk comparison group (Azzam & Jacobson, 2013) was useful to determine whether preservice teachers differ significantly from the general public on knowledge of retirement plans, preferences, general financial knowledge, and anticipated financial challenges in retirement. My study builds upon past research where preservice teachers had no significant differences in knowledge, as compared to the average U.S. consumer, on an array of personal finance topics (e.g., Brandon & Smith, 2009).

Teachers lack financial expertise and feel unprepared to teach financial concepts, with risk and investing being particularly weak areas (Way & Holden, 2009). Way and Holden (2009) state that “a chief concern among practicing teachers is whether or not they will have sufficient money for retirement. They are also concerned with the related issues of whether they are using the best strategies for investing their money” (p. 76). Because the first years of teaching are quite busy and emotionally turbulent (Liston, Whitcomb, & Borko, 2006), and this extends even to undergraduate work particularly during internships or field placements, early career teachers are unlikely to have the time or mental resources to focus on retirement planning. Therefore, addressing teachers’ lack of financial and retirement knowledge should start early, in preservice education programs. This dissertation provides supporting evidence for such efforts by surveying preservice teachers.

## **Purpose of Study**

The purpose of this study was to investigate the knowledge and perceptions of Florida preservice teachers toward retirement plans, investing, and personal finance, including challenges they anticipate facing in retirement. This survey of preservice teachers provides a window into participants' knowledge and financial future, and supports the importance of financial education in teacher education programs.

## **Background**

### **Financial Capability**

Financial capability is a term that can be defined as possessing knowledge of money and being able to apply it to one's benefit. It includes knowledge of one's retirement plans, salary, and other aspects of one's financial situation, knowledge of financial products and investing, and an action-oriented component where the subject is taking action for his or her financial future, such as contributing extra to a 401(k) plan. This is reflected in the following definition from the Center for Financial Inclusion (2013):

Financial capability is the combination of attitude, knowledge, skills, and self-efficacy needed to make and exercise money management decisions that best fit the circumstances of one's life, within an enabling environment that includes, but is not limited to, access to appropriate financial services. (para. 2)

Financial capability is inherently an eclectic construct that cuts across many aspects of one's life, and is essential to one's overall financial wellness (Joo, 2008). One must be knowledgeable about mathematics, financial products, taxes, and numerous other issues at a macro level, while also being able to deploy this knowledge both strategically, in the context of long-term planning, and tactically, in the context of day-to-day affairs (Braunstein & Welch, 2002).

A core pillar of financial capability is planning ahead for one's future, including retirement (Lusardi & Mitchell, 2007). This requires not only self-discipline at both tactical and strategic levels, but also knowledge and forethought, including prioritizing retirement concerns—setting up payroll deductions, putting aside money, learning about retirement accounts and investments, and following through throughout one's life (Lusardi & Mitchell, 2014). For teachers in Florida, a large portion of their retirement concerns are taken care of for them through compulsory participation in the Florida Retirement System (FRS) and Social Security, although a sizable benefit from the former is contingent on being a public worker in Florida for potentially as long as 33 years (MyFRS, 2011), and from the latter by having earned income throughout one's life that is subjected to Social Security taxes (Shoven & Slavov, 2012).

### **Pension Plans**

Pensions are the archetypal type of DB retirement plan. Pensions pay a monthly benefit in retirement based on a formula, typically consisting of years of service, average salary during some segment of one's career, and a multiplicative factor. Pensions have largely disappeared in the private sector, but remain widespread among public workers, of which teachers are one of the largest groups (Hansen, 2010). Pensions for public workers are often organized and managed at the U.S. state level, and for several decades have been experiencing a funding crisis under which states do not have enough capital and/or are not contributing a high enough percentage of salaries to fund projected future benefits (Aldeman & Rotherham, 2014). In many states, such as Florida, this has resulted in pension benefits being watered down for current and future teachers (MyFRS, 2011), particularly in the aftermath of the Great Recession of 2007–2009 (herein, “Great Recession”) which decimated pension funds and securities investments around the world (Hasler, Lusardi, & Oggero, 2018). Because employer-sponsored retirement plans are a key part

of a teacher's total compensation package, it stands to reason that preservice teachers should be well informed on the subject, being that they have selected an undergraduate major that prepares them for a teaching career. Unfortunately, this is not the case (Kimball et al., 2005).

**Underfunding.** Teacher pension plans are notorious for being underfunded or back-loaded (Hansen, 2010), meaning that many states have larger actuarially calculated obligations than their fund portfolio and incoming contributions can pay for. This leads to back-loading of benefits where each worker only accumulates substantial pension value in the third decade of their career, and new contributions go toward immediate payment needs for retirees, rather than being invested for the benefit of the current generation (Backes et al., 2016; Chang, 2016; Kan, Fuchs, & Aldeman, 2016). This tendency to underfund has led many states to reduce benefits and increase vesting periods on a going-forward basis, which lowers the number of teachers who will receive benefits and ensures they will receive less in retirement than prior teachers (Chingos & West, 2015). In Florida, it manifested with unfavorable changes in 2011, consisting of a new 3.0% payroll deduction for both DB and DC participants, the DC employer contribution decreasing from 9.0% to 3.3%, the DB vesting period increasing from five to eight years, the DB average highest salary lookback period increasing from five to eight years, full DB benefits requiring 33 years of work or reaching Age 65 instead of 30 years of work or reaching Age 62, and the complete removal of cost-of-living adjustments going forward (MyFRS, 2011; Snell, 2012).<sup>1</sup> Many teachers are not aware of the risks they face. Moreover, it stands to reason that a watering down of benefits should be “priced in” to teacher salaries—they should receive higher

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<sup>1</sup> Also, the interest rate on contributions to the FRS Deferred Retirement Option Program (DROP), which is available to workers hired before July 1, 2011 who reach 30 years of service or Age 62, or workers hired after who reach 33 years of service or Age 65, was slashed from 6.5% to 1.3% (MyFRS, 2011).

salaries now to compensate. No evidence shows this to be the case, which means that teacher salaries have effectively declined in recent years (Allegretto & Mishel, 2016).

**History of pensions.** The origins of the pension go back at least as far as the Roman Empire, where military pensions were for at least two centuries quite generous, but eventually became less generous and more difficult to qualify for (Phang, 2008; Wills, 2014). Pensions are important both for retaining talent and ensuring quality of life in retirement (Rhee & Joyner, 2019). Since the 1970s, they have largely disappeared from the private sector in the United States (Hansen, 2010). However, pensions remain prevalent in the public sector, particularly in the field of education. About 97% of public teachers nationwide have a DB plan available, with many being automatically enrolled (Hansen, 2008, 2010). Unfortunately, most states have, like the Romans, made pensions less generous and harder to obtain in the wake of the Great Recession (Aldeman & Rotherham, 2014; Hansen, 2010). This may go unnoticed, as many teachers have little knowledge of the benefits they are actually being offered (Fitzpatrick, 2015).

**Concerns for teachers.** In the 21st century, the only DB retirement program most American workers will receive payments from is Social Security.<sup>2</sup> These payments typically amount to only about 40% of the worker's wage-index average earnings (Biggs & Springstead, 2008)—that is, their average pay, adjusted for inflation, throughout their career. In the private sector, a large part of the burden for retirement planning has shifted to individuals, who must now direct their own contributions to DC retirement programs in order to adequately fund their retirement, including making investing decisions and resisting the urge to cash out one's account

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<sup>2</sup> Although Social Security is funded on a pay-as-you-go basis, for practical purposes it functions as a DB program for recipients, except with the caveat that Congress can modify the program at any time.



balance prematurely. However, pensions remain widespread in the public sector, and in fact 40% of U.S. teachers—those in California, Louisiana, Massachusetts, and 12 other states—do not contribute to Social Security at all due to their employers opting out of the program (Rhee & Joyner, 2019). Without Social Security, such teachers are extremely dependent on their states' retirement plans. When considering teachers' relatively low income and potentially burdensome student loan debt (Allegretto & Mishel, 2016; Montalto et al., 2019; Scott-Clayton, 2018), financial literacy and understanding of both DB and DC retirement programs is important for teachers' financial future, particularly if Social Security benefits will not be received.

### **DC Plans**

Whereas by definition DB plans do not require the user to make investment decisions and pay a stable monthly benefit in retirement based on a formula that is stipulated without regard to the investment returns the plan administrator receives, in DC plans the user makes contributions, makes investment decisions, has a balance that can go up or down, and makes withdrawals from the account in retirement (Hansen, 2010). DC participants bear a greater number of risks than DB participants; they are exposed to fluctuations in market valuations of their investments and there is no guarantee their account balance will last their entire retirement. In fact, an unwise DC retiree could take their balance as a lump sum and promptly fritter it away, whereas most DB plans provide a monthly payment without a lump-sum option, rewarding longevity with a greater quantity of payouts (Hansen, 2010).

DC plans include the well-known 401(k) retirement plans offered by most private-sector employers, 403(b) plans offered to many public and nonprofit employees, 457 deferred compensation plans, individual retirement arrangements (IRAs) that one establishes independent of an employer, and plans such as the FRS investment plan which do not fit into the preceding

categories, but can be rolled over into an IRA after one leaves FRS employment (Goldhaber & Grout, 2016). Other DC plans exist that are not targeted toward retirement, such as health savings accounts and 529 college savings plans. In principle, a taxable bank or brokerage account is a DC account, but DC plans differ by offering employer and employee incentives, tax avoidance, and a commitment device: One cannot typically make withdrawals from a DC account until Age 55 or Age 59½ without incurring substantial tax penalties (Brown & Larrabee, 2017; Sourdin, 2008).

DC plans offer a smooth accrual of benefits and portability, meaning there is not a sudden spike as seen with pension value after working a certain number of years (usually 20–33 years; Costrell & Podgursky, 2009a), and one can switch employers without sacrificing promised benefits (Bodie, Marcus, & Merton, 1988). Certain states, such as Florida, offer teachers a choice between a DB and DC plan, with each plan coming with a set of benefits and downsides. If a teacher is going to work within the same pension system for 25 years or longer, DB plans are usually more advantageous (Goldhaber & Grout, 2016; Rhee & Joyner, 2019). However, if an early or mid-career teacher moves to another state or starts teaching at a private or charter school that does not participate in their prior pension system, it may be orphaned and of little value (Goldhaber & Grout, 2016; Olberg & Podgursky, 2011).

### **Hybrid Plans**

It has recently become more common for retirement systems to offer hybrid plans that have a DC component where one makes investment choices, along with a DB component that is smaller than the typical, pure DB plan. The state of Washington is one such example (DeArmond & Goldhaber, 2010). Another variant is the cash balance plan, which is by definition fully funded because each employee's contributions are earmarked in a personal account with a balance that

earns interest and can be either taken as a lump sum or annuitized in retirement, like a DB pension plan (Kan et al., 2016). Because my focus regarding retirement plan preferences is primarily between DB and DC plans, I do not rigorously distinguish between cash balance plans and other hybrid plan structures.

## **FRS**

The FRS is a retirement plan for state employees in Florida, including Florida teachers. It allows participants to select a DB or DC plan, with a vesting scheme that requires one year of service for the employer-portion of DC plan benefits to vest, or eight years in the case of DB benefits (Florida Division of Retirement, 2018). Participation is mandatory, with teachers being part of the general risk class. Presently, all employees must contribute 3.0% of salary regardless of which plan they choose, whereas their employers contribute 3.3% if choosing the DC plan or 6.2% to the pension fund if choosing the DB plan. In 2018, the state legislature changed the default option from the DB plan to the DC plan (Florida Division of Retirement, 2018), in part as a cost-saving measure. In accordance with Thaler and Sunstein's (2008) recommendations to "nudge," the DC plan defaults participants into a target-date retirement fund appropriate for their age, which gives them equity exposure that is beneficial to long-term wealth, unlike the common practice of defaulting into a low-yield money market fund. For vested members, the DB plan uses a formula of  $.016 \times \text{years of service} \times \text{average salary in eight highest years}$  to calculate annual benefits in retirement. Full retirement is considered to be Age 62 or 30 years of service (whichever is soonest) for enrollees before 2011, and Age 65 or 33 years of service afterward.

The FRS pension plan is about 84% funded as of July 1, 2018 (Florida Department of Retirement, 2018), with \$161 billion of assets and \$191 billion of liabilities, which is a projected \$30 billion shortfall. Many other states' pension plans are only 75% funded or even less (Backes

et al., 2016; Chang, 2016; Kan et al., 2016), which means Florida is doing relatively well. However, a lack of funding incentivizes state legislatures to make unfavorable changes, which occurred in Florida in 2011 (MyFRS, 2011), with a new 3.0% employee contribution requirement and removal of cost-of-living (inflation) adjustments in retirement. Taken together, this is a downgrade of benefits for new teachers that constitutes an invisible pay cut. Teachers starting after July 1, 2011 who work to full retirement age can expect a pension that is 52.8% of their salary during the average highest eight years plus Social Security benefits in retirement, with no inflation adjustments during retirement unless the Florida legislature changes the laws. The FRS has an education and outreach program (<https://www.myfrs.com>), and one of the goals of my research is to measure awareness of these offerings among Florida preservice teachers. In order to maintain the same standard of living as the prior generation (Backes et al., 2016), new teachers must set aside wages above and beyond their pension and Social Security contributions.

**Position alongside other retirement plans.** The FRS, along with Social Security, are the core pillars of Florida teachers' retirement and require mandatory participation. However, teachers can elect to participate in other DC plans to supplement their retirement income. Although within the FRS, one can participate only within the pension (DB) or investment (DC) plan, teachers can also elect to contribute part of their salary to a 403(b) plan, which is similar to a 401(k). Additionally, they can make elective contributes to a state-sponsored 457 deferred compensation plan and/or to an IRA. However, the FRS and Social Security are the only programs that Florida teachers must participate in, and contribution rates for both are fixed.

### **Financial Challenges**

Americans have been shown to face many financial challenges in their daily lives. Based on responses to survey items asking whether they could come up with \$400 on the spot or \$2,000

within 30 days, at least a third appear to be financially fragile, living paycheck-to-paycheck and unable to absorb even a small financial shock (Hasler et al., 2018; Lusardi, 2019). New teachers are no exception to this; in fact, like many young Americans they tend to be burdened with hefty student loan balances that greatly exceed past generations (Lusardi, de Bassa Scheresberg, & Oggero, 2016). Over time, financial challenges are compounded for women and minorities due to factors such as overly conservative investment strategies (Farrell, 2009; Lusardi & Mitchell, 2008) and lower pay due to the gender pay gap (Mandel & Semyonov, 2014), but poor financial decisions and low financial capability also affect the broader American population as a whole (Lusardi, 2011). With teachers being a mostly female workforce who are paid at least 11% less than other professions requiring equivalent education (Allegretto & Mishel, 2016), it makes sense that many preservice teachers agree with items such as “I want to save for retirement, but don’t think my salary will be enough to afford it” (Lucey & Norton, 2011, p. 21). Although financial challenges have been studied in the broad population, a specific focus on preservice teachers is missing from the literature.

### **Financial Wellness**

Financial wellness is a term that holistically encompasses both financial capability and one’s financial state. Montalto et al. (2019) offer this definition: “Financial wellness is multidimensional, incorporating all aspects of a person’s financial situation, including their awareness of their financial situation, goal setting to maintain or improve their current financial situation, and the capability to put these goals into action” (p. 3). A primary reason to look at financial wellness rather than a narrower focus on financial capability is that the two are not necessarily related. One could have strong financial capability yet not be financially well-positioned to apply their knowledge, or one could be in a sound financial position yet lack the

financial literacy to effectively sustain and capitalize on their position (Willis, 2009). Whereas the term “financial capability” subsumes both financial literacy (e.g., raw knowledge) and the ability to apply it, “financial wellness” subsumes financial capability and one’s actual financial situation at hand. Although one can technically be financially literate or financially capable while drowning in debt, such an individual would not be financially “well.” However, it should be noted that popularity of the term “financial wellness” has hitherto been confined to employer-sponsored financial education initiatives and literature, typically in the private sector (Garman, Kim, Kratzer, Brunson, & Joo, 1999).

### **Research Questions**

My study seeks to answer the following five research questions:

1. What is the extent of Florida preservice teachers’ knowledge regarding personal finance and investing, the Florida Retirement system, and retirement plans in general?
2. To what extent do Florida preservice teachers anticipate facing financial challenges in funding their retirement and during retirement?
3. How do Florida preservice teachers compare to college students and graduates ages 18–25 on financial, retirement, and investing knowledge?
4. To what extent is anticipated teaching career length predicted by DB–DC preference, DB versus salary preference, and concern about meeting Florida’s eight-year DB vesting period?
5. To what extent is the investment allocation sophistication of preservice teachers predicted by financial knowledge, possession of financial or retirement accounts, DB–DC preference, and demographic characteristics?

## **Construction of Survey**

Instruments that produce valid and reliable scores regarding retirement knowledge and preferences are missing from the extant literature, particularly regarding pension plans (Lucey & Norton, 2011), so I have written many new questions in my survey instrument. In their survey research and focus groups, Ettema (2011) and Smith (2012) took a similar approach, addressing a need for research on in-service teacher retirement preferences, which in part inspired my current research. However, their research did not include a portfolio-building exercise nor questions focused on the retirement and financial knowledge and perceptions of preservice teachers. My study included these, which allowed actual and perceived financial and retirement knowledge among preservice teachers to be compared, and comparisons with a reference group solicited via MTurk were also made (Azzam & Jacobson, 2013; Casler et al., 2013).

## **Possible Findings**

Although this study was largely exploratory, based on past research certain outcomes are suggested, but are not definitive. These possible findings are summarized in Table 1.

Table 1

*Summary of Possible Findings Based on Past Research*

<b>Research Question</b>	<b>Anticipated Findings</b>
Research Question 1: Preservice Teacher Knowledge	Familiarity with the FRS and other retirement plans is anticipated to be low (DeArmond & Goldhaber, 2010; Lucey & Norton, 2011). Financial knowledge is also anticipated to be low, consistent with in-service teachers (Way & Holden, 2009).
Research Question 2: Anticipated Retirement Challenges	Because debt and retirement concerns are ubiquitous (e.g., Montalto et al., 2019), differences are anticipated to be small between preservice teachers and MTurk participants, but may have increased since Lucey and Norton's (2011) survey due to declining teacher pay and benefits (Allegretto & Mishel, 2016).
Research Question 3: How Do Preservice Teachers Measure Up?	Although there is not necessarily evidence to suggest large differences, because the preservice teacher sample will be majority female whereas the MTurk sample will be more evenly divided, preservice teachers may be significantly less financially knowledgeable and sophisticated at investing (Farrell, 2009).
Research Question 4: Career Length, Preferences, and Vesting Concerns	Because newer teachers tend to prefer DC plans (e.g., DeArmond & Goldhaber, 2010), preservice teachers may prefer the same. A salary increase may be preferred over a pension plan (Fitzpatrick, 2015). Anticipated career length may correlate negatively with vesting concerns and positively with a preference for pensions.
Research Question 5: Investment Allocation Sophistication	Some participants will demonstrate cognitive biases such as $1/n$ by allocating 20% to each of the five given options (Benartzi & Thaler, 2007), while others will prefer the low-risk money market and bond funds despite the dire investing consequences as compared with stocks over the long term (Zanglein, 2001).



Research suggests that preservice teachers' familiarity with DB and DC plans will be low (e.g., Lucey & Norton, 2011). Although retirement knowledge increases with experience teaching, early-career and preservice teachers tend to know less (DeArmond & Goldhaber, 2010). Preferences are anticipated to favor salary rather than pension benefits, based on past research where teachers profoundly undervalued an increase in future retirement benefits (Fitzpatrick, 2015). Among both samples, low financial knowledge is anticipated, in alignment with the general public (Lusardi, 2019).

For Research Question 5, I have created a portfolio allocation exercise that includes no nudge in the right direction, which is why unwise decisions such as the  $1/n$  error are anticipated (Benartzi & Thaler, 2007; Thaler & Sunstein, 2008). Note that in the FRS DC plan, if no selection is made, 100% of funds are invested in a target-date retirement fund commensurate with employee age (Florida Division of Retirement, 2018). I have included five of 22 FRS DC options for simplicity (MyFRS, 2019b), one of which is the FRS 2060 target-date fund (MyFRS, 2019c) which is applicable for the age range of most preservice teachers. I anticipate that participants' responses will be markedly inferior to the default FRS DC allocation. If so, this will provide specific evidence that preservice teachers are not prepared to make retirement investing decisions, which supports the use of DB plans or DC plans that, by default, pick a target-date retirement fund based on the enrollee's age, as the FRS investment plan does. This may be the best overall solution and is unlikely to be modified by plan participants, who frequently do not switch from the default option (Beshears, Choi, Laibson, & Madrian, 2009; Choi, Laibson, Madrian, & Metrick, 2002; Mitchell, Mottola, Utkus, & Yamaguchi, 2006, 2008).

## Theoretical Framework

My research is influenced by Joo's (2008) financial wellness theoretical framework (Figure 1; see also Robb & Woodyard, 2011). Although brief, my survey covers several areas from the financial wellness framework. By using both self-assessed measures of financial knowledge and quiz items, I assess both the subjective perceptions and objective financial knowledge of participants, which also facilitates comparison between the two to assess participants for overconfidence (e.g., Mitchell & Abusheva, 2016). In addition, I ask questions to measure familiarity with general retirement accounts and FRS-specific knowledge. I measure financial attitudes with several items: preference for pension or salary increase, preference for DB or DC plans, and six financial challenges items used with permission from Lucey and Norton (2011) which also indirectly assess financial satisfaction. Finally, a portfolio allocation exercise in my survey will give insight into financial behaviors of preservice teachers.

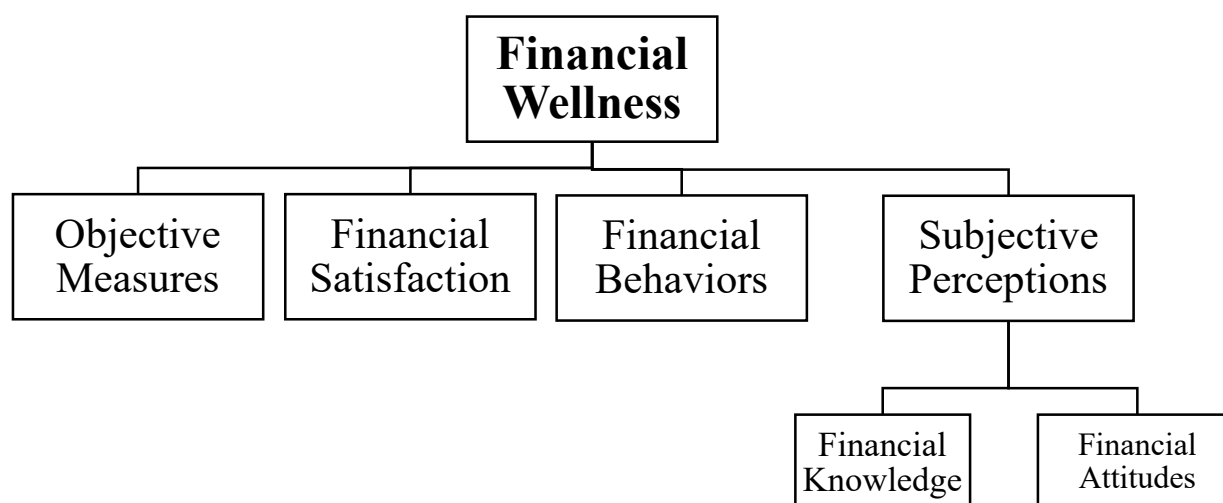


Figure 1. Financial wellness theoretical framework by Joo (2008).

Regarding teachers, the financial wellness framework applies to their retirement planning because of a reliance on state retirement benefits, and typically DB benefits, inherent to the field. With vesting requirements and jagged accrual patterns favoring long-term workers (Costrell & Podgursky, 2009a), holistic financial wellness is of importance because teachers are, to an extent, stuck in a particular career, state, and retirement system (Goldhaber, Grout, & Holden, 2017). Their financial satisfaction and perceptions are important toward persisting in their career (Liston et al., 2006), particularly with the intergenerational inequities that are coming to fruition due to old debt related to more generous benefits offered to the prior generations of teachers (Backes et al., 2016), resulting in reduced benefits and pay for current and future generations of teachers (Allegretto & Mishel, 2016). Although other frameworks, such as the theory of planned behavior (Ajzen, 1985), might be entertained as relevant to teachers' financial concerns, pension benefits do not seem to be a salient concern for undergraduates' selection of career nor choice of teaching employer (Fitzpatrick, 2015), and a financial-specific framework is needed to encompass the multitude of financial issues studied herein, pertaining to all areas of Joo's (2008) financial wellness framework. This includes both one's financial capability and one's financial situation, for it is possible to have a high level of financial capability while being stuck in a hopeless financial situation, so both elements must be considered.

### **Conclusion**

Surveying the financial and retirement knowledge and perceptions of Florida preservice teachers will elucidate the preferences and concerns of soon-to-be teachers in a state where public workers are offered an unusual choice between a DB and DC retirement plan at the outset of their careers (Chingos & West, 2015). Querying preservice teachers on their awareness of FRS educational offerings will shed light on whether increased outreach efforts are needed. With

the next generation of teachers facing lower salaries (Allegretto & Mishel, 2016), reduced retirement benefits (Backes et al., 2016), and higher student loan debt (Lusardi et al., 2016), their financial security is a prescient topic that demands attention. In the next chapter, I will review relevant literature in greater detail and breadth, including the contexts of economics knowledge, financial wellness, and retirement preparedness among both preservice and in-service teachers.

## CHAPTER TWO: LITERATURE REVIEW

In order to have a meaningful understanding of the issues teachers face with respect to their retirement programs and planning, it is necessary to study financial capability, teacher retirement systems, retirement planning, and retirement plan characteristics and teacher preferences, as well as the literature on teacher retirement knowledge specifically and financial and economics knowledge in general. Preservice teachers are of relevance not only because they are about to start their careers in an environment of low salaries (Allegretto & Mishel, 2016), decreased benefits (Backes et al., 2016), burgeoning student debt (Lusardi et al., 2016), and a pervasive lack of emergency savings (West & Mottola, 2016), but also because due to their long time horizon, plans and preparations made for retirement now will have compounding benefits to them in the distant future. In Florida, new hires have the unusual opportunity to choose between a DB and DC retirement plan (Florida Division of Retirement, 2018), which requires knowledge and foresight about one's career that preservice teachers are unlikely to have. Although my review covers the limited literature that is available on preservice teachers' retirement concerns and financial knowledge, I expand into broader economics knowledge and retirement issues among both pre- and in-service teachers, which offer additional insights that are of relevance. In particular, a common finding is that teachers' knowledge improves not only teachers' financial wellness, but also benefits their students' financial knowledge.

### Introduction

#### Definitions

**Financial literacy, capability, and wellness.** Financial literacy may be considered the knowledge-based subcomponent of financial capability, whereas one's individual financial

situation coupled with financial capability determine one's overall financial wellness (Joo, 2008). Although no concrete definition of financial literacy has emerged (Remund, 2010), its general characteristics have been agreed upon:

There is no universally accepted definition of financial literacy (Hung, Parker, & Yoong, 2009). Nonetheless, there is consensus that it relates to an individual's ability to effectively manage personal finances over a lifetime. This includes education that fosters better financial decision-making. (Ali & Frank, 2019, p. 232)

The above definition of financial literacy is broader than knowledge, encompassing effective management of personal finances. Because defining "literacy" broadly is atypical, many researchers are now using the term "financial capability" for improved clarity (Mottola & Kieffer, 2017). Financial capability is lacking throughout the world, across many demographic characteristics and with respect to numerous important financial topics (Lusardi & Mitchell, 2011a, 2011b). In particular, women, the young, and the old have less financial capability, which bodes poorly for the financial wellness of preservice teachers and college students in general, many of which are young women (Chen & Volpe, 2002; Mottola, 2013).

Lack of financial literacy has tangible and readily apparent financial consequences. Klapper, Lusardi, and van Oudheusden (2016) write: "Without an understanding of basic financial concepts, people are not well equipped to make decisions related to financial management. People who are financially literate have the ability to make informed financial choices regarding saving, investing, borrowing, and more" (p. 4). Planning for retirement is a key component of financial literacy. A clear example of the detrimental consequences of financial illiteracy is Choi, Laibson, and Madrian's (2011) study of vested employees Age 59½ and older with an available 401(k) match. They found that 36% of employees failed to contribute

the maximum employer match, leaving an average of \$507 per year “on the sidewalk,” to use the authors’ metaphor. This group was notable because they were eligible to contribute and then immediately withdrawal both their contributions and the employer match with no penalties, due to being vested in their 401(k) plans and Age 59½ or older at which 401(k) withdrawals are not subject to tax penalties. Moreover, Chan and Stevens’s (2008) review of pension knowledge provides evidence that Choi et al.’s (2011) findings extend to DB plans in addition to DC plans.

**DB and DC plans.** Principally, retirement plans can be classified into DB plans that do not require the user to make investment decisions and pay a stable monthly benefit in retirement based on a formula that is stipulated without regard to the investment returns the plan administrator receives, and DC plans where the user makes contributions, makes investment decisions, has a balance that can go up or down, and makes withdrawals in retirement (Hansen, 2008, 2010). Over time, a DC account’s balance grows via accumulation of employer contributions, employee contributions, and interest or investment returns, whereas a DB plan’s value grows based on a formula (Choi et al., 2002). A pension is a prime example of a DB plan, and Social Security can generally be regarded as a DB plan as well, albeit with a different funding mechanism (Lachance, Mitchell, & Smetters, 2003). DC retirement plans include corporate 401(k) plans and education/non-profit 403(b) plans, 457 deferred compensation plans, and IRAs (Ali & Frank, 2019). Another key difference is that DC plans have a balance that can be depleted to zero or left to heirs (Bodie et al., 1988), whereas DB plans cannot be depleted (except in rare exceptions where a lump-sum option is provided), continue until death, and cannot be left to heirs (although a survivor’s benefit may be included).

## **Financial Education Movement**

Here, I will discuss several key items regarding recent financial education initiatives stemming in part from the Great Recession of 2007–2009. These are of broad relevance to the financial knowledge and education of preservice teachers, in part due to the fact that teachers are increasingly being tasked with providing financial education to students (Brandon & Smith, 2009; Council for Economic Education, 2018; Henning & Lucey, 2017; Jump\$tart Coalition for Personal Financial Literacy [Jump\$tart], 2015; Way & Holden, 2009).

**Before the Great Recession.** Although the time leading up to the Great Recession was prosperous, it was also marked by financial institutions' heavy over-extension of credit which resulted in unsafe debt proportions among American households (Hanna, Yuh, & Chatterjee, 2012). Based on fifteen years of data from the Federal Reserve Board's Survey of Consumer Finances, Hanna et al. (2012) found that consumer debt increased, with 27% of households having a heavy debt burden (defined as more than 40% of their income going toward debt payments) in 2007 as compared with 18% in 1992. These debts, combined with a stock market plunge and crushing loss of jobs, compounded the negative effects for many American households, which have persisted (Hasler et al., 2018; West & Mottola, 2016). The crisis also brought about a renewed focus on financial education (e.g., Lusardi & Mitchell, 2014).

**Curricular requirements.** A movement in support of financial education emerged in response to the Great Recession. Jump\$tart, a Washington, D.C. think-tank funded by the U.S. government and corporations including Charles Schwab and Bank of America, gained increasing clout. The organization's *National Standards in K–12 Personal Finance Education*, now in its 4th edition (Jump\$tart, 2015), increasingly became adopted by states and school districts throughout the US. While the movement gained momentum, several commentators complained



about financial education on a theoretical basis—most notably, Willis (2008, 2009) who likens the movement to teaching citizens to represent themselves *pro se* in court or to perform their own medical procedures. More recently, Pinto (2013) argued that the movement is misguided in both its suggested implications and underlying assumptions. Although support for this position exists, it is notable that education on retirement issues has not received more attention.

**Detrimental effects of debt.** Consumer debts are liabilities that may inhibit both retirement and taxable investing. Credit card debts, auto loans, private or unsubsidized student loans, and personal loans have high interest rates, which means that paying off these debts can and should take priority over many forms of investing. Recent research has shown that many Americans have little to no savings, as well as substantial liabilities (West & Mottola, 2016). This inhibits discretionary DC retirement contributions. If funds are available, paying down a debt provides a guaranteed, immediate return in interest savings compared to what one would have paid in interest had he or she not paid down the debt, which can be preferable to making DC contributions. In light of large consumer debts that the next generation of teachers and other emerging adults are beginning their careers with (Montalto et al., 2019; Scott-Clayton, 2018), retirement investing becomes harder, and financial education may be of increased importance toward avoiding, repaying, or renegotiating debts.

### **DB and DC Retirement Plans**

DB retirement plans, or pensions, offer a monthly benefit in retirement calculated by a formula. In Florida, the formula for teachers' annual pension benefit is  $.016 \times \text{years of service} \times \text{average salary in eight highest years}$  for teachers who retire at Age 65 having begun working after 2011 with a tenure of 8–33 years, with the option to increase the .016 multiplier to as high as .0168 by working to Age 68 or for 36 years (Florida Division of Retirement, 2017, 2018).

Teachers who work 33 years can begin receiving full benefits immediately, even if they have not reached Age 65. This formula results in annual pension benefits as a percentage of salary as depicted in Table 2.

Table 2

*FRS Annual Pension Benefits for Hires After July 1, 2011 Based on Years Worked As a Percentage of Average Salary in Eight Highest-Earning Years*

<b>Years Worked</b>	<b>Formula</b>	<b>Pension %</b>
8	$.016 \times 8 \times \text{Average salary}$	12.8
15	$.016 \times 15 \times \text{Average salary in highest eight years}$	24.0
25	$.016 \times 25 \times \text{Average salary in highest eight years}$	40.0
33	$.016 \times 33 \times \text{Average salary in highest eight years}$	52.8
36	$.0168 \times 36 \times \text{Average salary in highest eight years}$	57.6

With legislative changes enacted in Florida in 2011 (MyFRS, 2011; Snell, 2012), “cost of living” or inflation adjustments were removed, meaning all DB payments for hires after July 1, 2011 will no longer increase by 3.0% during each year of retirement. This reduces real pension benefits during retirement, in addition to real losses incurred during the gap between vesting and receiving retirement benefits for people who leave before Age 65 or 33 years of service.

Although a teacher who started at 22 can retire at 55 and immediately receive a pension of 52.8% of salary, as well as Social Security benefits beginning as early as Age 62, if leaving a year earlier the FRS pension is delayed until Age 65.<sup>3</sup>

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<sup>3</sup> Although the FRS offers early retirement, it is ill-advised because it includes a 5% reduction per year, meaning that retiring 11 years early would result in one only receiving 45% of the normal benefit.

Notably, one does not manage any investments or suffer market risks in a DB plan. These risks are borne by one's employer. Although one must work the requisite years in a pension system, the formula is simple and predictable. On the other hand, DC accounts such as the FRS investment plan, 401(k)s, 403(b)s, and IRAs have an account balance that is invested and divested by the owner. In DC plans, workers must make decisions and bear investing risks, and there is no guarantee of stable lifetime income in retirement.

### **History and Background**

Pension plans used to be commonplace in both the public and private sectors, but disappeared from the private sector following the Employee Retirement Income Security Act of 1974, which protected employees by requiring employers to fund pension plans in advance, among other rigorous financial requirements (Hansen, 2008, 2010). This prompted private sector employers to both scale back DB benefits and to replace DB plans with DC plans, such as 401(k) plans, which came about in the late 1970s. Nonetheless, DB plans continued to be prevalent in the public sector, with the majority of public employers still offering DB plans, of which teachers are the single largest employee group (Rhee & Joyner, 2019). In part, this was because the public sector was exempted from the rigorous requirements of the Employee Retirement Income Security Act, which means that many public-sector DB funds operate on an underfunded basis (Aldeman & Rotherham, 2014), which can lead to state lawmakers cutting benefits for new and early career employees in order to close gaps in funding (Chingos & West, 2015; MyFRS, 2011; Snell, 2012). Public DB plans are typically organized at the state level with teachers and other public workers sharing the same pension fund (e.g., Florida; Florida Division of Retirement, 2018), although they are sometimes organized at the school district level in large districts (Olberg & Podgursky, 2011).

**Key differences between DB and DC plans.** By definition, DC plans are fully funded, because the employee and/or employer contribute a portion of salary to the account during each pay period (Bodie et al., 1988). This contrasts with DB plans, which pay benefits on an as-needed basis from available assets and/or inflows rather than earmarked funds (Hansen, 2010). A primary difference between DB and DC plans is that DB plans continue to pay each month until the recipient dies. Although a DB plan may pay a monthly survivor's benefit to a spouse or child after the recipient's death, there is no lump sum to be inherited. Like with Social Security, a pension recipient receives a higher amount of total benefits if he or she lives longer. In contrast, DC plans have a balance that is diminished by withdrawals which are at the discretion of the account holder, and could reach zero long before the recipient dies. Also, most DC plans can be rolled over to a non-employer-affiliated IRA upon employment separation, and the unused account balance can be left to heirs upon one's death, unlike a DB plan (Bodie et al., 1988; Hansen, 2008, 2010).

**Purposes of DB and DC plans.**

**Tax benefits.** Both DB and DC plans are supported by U.S. tax laws and function as nonwage benefits. Therefore, both employers and employees are incentivized to offer retirement benefits instead of an equivalent salary increase which would be taxed at a higher rate (Woodbury, 1983). Taxes that would otherwise occur include employee income taxes and payroll taxes paid by both the employer and employee to Social Security and Medicare, but these are not collected on retirement benefits, for the purpose of encouraging accumulation of retirement wealth. In retirement, interest and capital gains on DC contributions typically are either tax-free upon withdrawal or were not taxed when contributed, which allows larger growth

over long periods of time, as well as deferring taxes until one has a lower annual income (in retirement) and consequently is in a lower tax bracket (Clark & d'Ambrosio, 2003).

*Advantages of pooled risk in DB plans.* One downside of DC plans is that employees must individually assume investment risk. This means they must be comparatively conservative as they approach retirement. On the other hand, DB plans can function like an insurance pool, where risk is pooled between all plan members which allows for more aggressive investing that produces higher returns (Millard, 2017). At an individual level, such as with a DC plan, two prominent risks exist which are ameliorated via pooling in DB plans. Firstly, sequence-of-returns risk, which manifests when investments decline in value early in one's retirement (such as due to a stock market crash), can quickly erode an individual's retirement savings. However, a large pension fund can weather the storm through continuing in-flows from member contributions, hedging and diversified investments, and distributed risk (Millard, 2017). Secondly, longevity risk, or the risk that an individual outlives his or her retirement savings, is eliminated with DB plans, which guarantee payment throughout one's remaining life (Horneff, Maurer, & Mitchell, 2016). Although one could ameliorate this risk by purchasing an annuity with their DC plan balance, which provides a consistent monthly payment until one's death similar to a DB pension plan, pensions are effectively an annuity at a lower cost (as is delaying onset of Social Security benefits to obtain a higher monthly benefit; Shoven & Slavov, 2012<sup>4</sup>). Furthermore, annuities are dangerous because they are poorly understood by consumers, often carry large hidden fees and

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<sup>4</sup> Note that although the authors found that delaying claiming Social Security benefits to as late as Age 70 was financially advantageous for a subset of Americans, these individuals were *not* more likely to delay benefit onset, implying a lack of financial sophistication.

costs, and are aggressively marketed to consumers' detriment (Brown, Kapteyn, Luttmer, Mitchell, & Samek, 2019; Clark & Richardson, 2010; Mercado, 2018).

**Commitment device.** Both DB and DC plans function as a commitment device, meaning that they prevent detrimental financial outcomes related to poor self-control by making it difficult, costly, or impossible to prematurely cash out one's contributions (Sourdin, 2008). With many DB plans, it is not even possible to make withdrawals from the plan or cash out as a lump sum at all (Hansen, 2008, 2010). For DC plans, one can typically make withdrawals or take a loan from their plan, which makes such plans less effective as a commitment device (Thaler & Benartzi, 2004; Thaler, 2016), but this may still come with tax penalties and is onerous compared to swiping a payment card or making a withdrawal from a bank account. Overall, this makes it more likely that individuals will preserve wealth for their financial wellbeing in retirement.

### **Lack of Knowledge**

**DB plans.** Chan and Stevens (2008) find that most people know very little about their pension plans, and yet *perceived* pension incentives (Costrell & Podgursky, 2009a) are highly motivating to plan participants, even if the participant's interpretation is wrong. "Ill-informed individuals seem to respond systematically to *their own misperceptions* [emphasis added] of pension incentives" (Chan & Stevens, 2008, p. 253). Here, we see that a lack of knowledge can have negative financial implications even for DB participants where investing decisions are not required. Several common pension incentives are summarized in Table 3, and teachers who lack knowledge or are misinformed about their pension plans may make deleterious decisions regarding these phenomena (Costrell & Podgursky, 2009a, 2010; Hansen, 2010).

Table 3

*Common Pension Incentives and Explanations*

<b>Incentive</b>	<b>Explanation</b>	<b>How to Use or Avoid</b>
Cliff function	After working a certain number of years (e.g., 30), the pension's value stops increasing or even declines	Immediately retire, possibly to work another job while collecting one's pension benefits
Peaks	Related to cliff function. There are peaks based on years of service where the pension is worth more.	Retire at a peak, or continue working until the next peak
Spiking	Benefits are calculated based on salary during highest $n$ years	Increase pay by working overtime in $n$ years to increase pension benefit
Vacation hours	Vacation hours accrue without a cap, are paid at <i>current</i> salary, and may extend years of service	Accrue months or years of vacation hours and redeem all at one's highest salary immediately before retirement, which may extend years of service too
Valleys	Pension value is low until a certain number of years worked (e.g., 25)	Keep working until out of the valley
Vesting	Pension has no value until a certain number of years, typically five, eight, or 10 (eight in Florida)	Enroll in the DC option with shorter vesting period if available (e.g., in Florida), keep working, or quit quickly

**DC plans.** Participants in DC plans are more negatively affected by their lack of knowledge, as well as behavioral biases and poor financial situations (Benartzi & Thaler, 2002, 2007). They often put money in undiversified investments or overly conservative or overly risky portfolios (Dimmock, Kouwenberg, Mitchell, & Peijnenburg, 2018), contribute too little, invest in the wrong funds with high management fees, and jump in and out of the securities markets rather than staying consistently invested (Bogle, 2009; Mottola & Utkus, 2009; Richards, 2012). They may be prompted to tap their DC account as an emergency fund or when separating from

employment, destroying retirement wealth (Rhee, 2013). For teachers in states where DC plans are available as an option or have wholly replaced DB plans, one estimate is that 77% would accumulate more retirement wealth with a DB plan (Rhee & Joyner, 2019), even if we are generous and pretend that they will avoid the aforementioned common DC investing mistakes. Nevertheless, a large swath of teachers and other public workers, particularly if younger, prefer DC plans (e.g., Chingos & West, 2015), despite the dangers to their retirement income security.

**Financial loss as a consequence of lacking plan-specific knowledge.** Chalmers et al. (2014) studied Oregon’s retirement system using administrative data from 1990 to 2003. The Oregon system uses a combination of DB, DC, and hybrid DB–DC calculations and “pays the maximum benefit for which the member is eligible” (p. 17). For instance, a teacher leaving after only a few years of service would receive benefits based on a DC formula, whereas a veteran teacher retiring after 30 years of service would have the DB formula applied. In a stark example of the financial costs of a lack of program-specific retirement knowledge, at least 2.7% of Oregon public employees during 1990–2003 who retired did so with poor timing, perhaps due to the complex and capricious calculation scheme.<sup>5</sup> During 1990–1996, benefit calculations were increased by a mean of 2.2% in employees’ birth months, yet 398 employees retired in the month before their birthday during this timeframe. In addition, a peculiar rule where the DC formula was based on equities market returns updated only once per year, in March (“stale returns”; Chalmers et al., 2014, p. 18), resulted in 548 workers’ unfortunate retirement in February during years where stocks did particularly well. By not waiting until March, these workers lost a mean

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<sup>5</sup> The Chalmers et al. (2008) study looked at 35,129 retiring Oregon public employees. Although it unfortunately did not provide separate data for teachers, who constituted less than 10% of the sample, it is likely that teachers made retirement mistakes of similar magnitude and frequency as other public workers.



of 2.6% of retirement wealth, with some losing as much as 20.5% (Chalmers et al., 2014). Consider that the S&P 500 index, which roughly approximates the broader stock market, increased by 34% in 1995, but went *down* by 1.5% in 1994 (Macrotrends, 2019). Under the Oregon scheme, DC-receiving retirees who made the calamitous decision to retire in February 1996 missed out on 1995, a banner year, whereas those who waited until March 1996 or thereafter benefited from the 1995 rally, resulting in DC benefits that were over 20% higher.<sup>6</sup>

***Corollaries and ramifications.*** Although Chalmers et al. (2014) is just one example, such peculiarities and complexities are common in retirement systems and in the world of finance in general (Willis, 2008). Seemingly inconsequential decisions may have disastrous consequences, as those who were bamboozled into adjustable-rate mortgages prior to the Great Recession can attest (Ross & Squires, 2011), or anyone who entered a cycle of high-interest debt beginning with receipt of a credit card advertisement (Peltier, Dahl, & Schibrowsky, 2016; Robb, 2011). The FRS is not without such potential pitfalls; DB participants, as with any plan with a vesting period, suffer substantial losses if they do not make it to eight years of service (Florida Division of Retirement, 2018). Furthermore, my prior example of Florida teachers starting in their early 20s after 2011, acquiring 33 years of service in the DB plan makes them immediately eligible for full retirement benefits, whereas leaving even at 32 years, 11 months of service requires them to wait until Age 65 to receive their monthly pension. For a teacher starting at Age 22, this amounts to 10 years of missed benefits. Although rare, another thought-provoking and little-known peculiarity is that FRS members who commit a felony while employed forfeit the entirety of all

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<sup>6</sup> Note that the actual returns were less extreme than the volatility observed in the S&P 500 due to inclusion of a diverse selection of investments. Note also that the reverse of 20% *lower* is 25% *higher*.

accumulated employer contributions to their FRS DC account balance or DB accrued benefits,<sup>7</sup> unlike with Social Security benefits, IRAs, or vested 401(k) balances (MyFRS, 2016). The majority of in- and preservice teachers do not even understand basic retirement terminology and key financial concepts (Lucey & Norton, 2011; Way & Holden, 2009). When combined with a lack of program-specific, idiosyncratic knowledge (Chambers et al., 2008), this puts them at a substantial disadvantage (see also Willis, 2008, 2009).

### **Teacher Pension Plans**

Teacher pension plans are typically organized at the state or district level and sometimes are part of a larger plan applying to all public employees in a particular state or region (Hansen, 2008, 2010). Although DB retirement plans (i.e., pensions) have largely disappeared in the private sector, they remain widespread for public employees in the United States. For teachers, they are frequently touted as powerful incentives toward recruitment and retention (Boivie, 2017; Kimball et al., 2005). However, this characterization is not without criticism.

Like any other job attribute, a pension plan or pension plan change can influence teachers' job searches and choice. Many pension plan changes have been proposed, at least in part to increase teacher attraction. To be effective as incentives, pension plan changes must meet motivational requirements: Teachers must be knowledgeable about pensions and accompanying financial issues, teachers must desire pension plan changes, and roadblocks to responding positively to the pension plan incentive must be removed.

(Kimball et al., 2005, p. 411)

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<sup>7</sup> Although Florida law says this pertains to felonies connected with one's job duties, a catch-all provision in the law has been interpreted by Florida courts to apply to the vast majority of felonies even outside the workplace (MyFRS, 2016).

It has been shown that a large proportion of in-service teachers are unaware of the finer details of their pension plans and consequently make suboptimal decisions (Chan & Stevens, 2008; Goldhaber & Grout, 2016), which implies that financially educating both pre- and in-service teachers is important. Notably, even with a DB plan, to receive the highest benefits, career decisions must be timed to accommodate the “peaks, cliffs, and valleys” (Costrell & Podgursky, 2009a, p. 176) in one’s pension value at various points in one’s career depending on how the retirement system in question calculates retirement benefits. Frequently, teachers dislike such schemes and would prefer a smooth rather than jagged accrual curve of pension benefits (McGee & Winters, 2019). In part, this may explain why when given a choice, many teachers select a DC plan instead of a DB plan (Clark, Hanson, & Mitchell, 2016), which is explored in the next section.

**Higher value of DB plans for career teachers and downsides for others.** For teachers, DB retirement plans are consistently more valuable for teachers who work in the same pension system for 25 years or longer, as compared with DC alternatives (Rhee & Joyner, 2019). Teachers who work a shorter time receive less, and may be better suited by DC plans. In Florida, the FRS offers both a DB and DC option with employer contributions to the former vesting in eight years and the latter in only one year. This means that mathematically, any new Florida public worker who ends up working more than one year but fewer than eight years would have been better off choosing the DC option. Although all separated employees are entitled to a refund of employee contributions (without interest; MyFRS, 2019a), unvested employer contributions are not refunded. FRS participants are given a one-time election to switch from the DC plan to DB plan, and this option was exploitable for profit as of Lachance et al.’s (2003) writing;

however, in 2011 the state cut their contribution rate to participants' DC plans from 9.0% to 3.3% of salary (a new 3.0% payroll deduction offset the cut; MyFRS, 2011; Snell, 2012).

***Third decade phenomenon.*** Overall, DB-participating teachers enjoy both higher benefits and a transfer of investment risk from teachers to their employers, but only for the approximately 75% of current teachers who will work long enough to receive a sizable monthly pension, as most pension wealth is accumulated in the third decade of employment (Backes et al., 2016; Chang, 2016; Costrell & Podgursky, 2009a; Kan et al., 2016; Rhee & Joyner, 2019). Although other analyses report that fewer than half of teachers work long enough for their pensions to vest, Morrissey (2017) rebuts this claim in defense of pensions with the supposition that teachers who quit after only a year or two should be given a much lower weight than veteran teachers. However, a teacher could merely move to another state or even begin teaching for a private or charter school in the same state (Olberg & Podgursky, 2011), consequently losing significant retirement income potential. Pension advocates say this is a feature, not a bug, because of “tremendous costs to schools in terms of recruitment and training” (Rhee & Joyner, 2019, p. 34), and purport:

The fact that service credits are worth more to teachers who retire after spending their careers in a single district is a positive feature of pensions because it discourages turnover, and this feature is not as disadvantageous to mobile teachers as critics suggest. (Morrissey, 2017, pp. 1–2)

However, a large contingent of teachers would prefer not to be locked in as such (Chingos & West, 2015), and the example of Florida shows that new, young teachers who make it to their third decade will be significantly penalized if they do not work for FRS employer(s) for 33 years (Florida Division of Retirement, 2018). Worker mobility is increasingly prevalent in terms of

both employers and geographic location (Hess, 2009), but new, young Florida teachers will certainly encounter six-figure losses if they become mobile in their third decade.<sup>8</sup>

*Teachers immobilized.* Although certain large districts such as Los Angeles and New York City have their own pension plans, in the FRS teachers can move between public schools or even a multitude of other public jobs at the state and municipal levels while transferring and continuing to earn retirement credits (Florida Division of Retirement, 2018). Nonetheless, pension schemes act as metaphorical “golden handcuffs”<sup>9</sup> (Ali & Frank, 2019, p. 221) that may have hidden costs in their prevention of teacher attrition such as teacher unhappiness, making teaching less desirable, and restriction of labor flow. The premise that teachers’ mobility must be hampered by pension schemes and licensure requirements is not without critics (Goldhaber et al., 2017), and to its credit, Florida’s DC option has proved popular for the portability it offers (Chingos & West, 2015). Costrell and Podgursky (2010) estimated that career teachers who move between pension systems (e.g., U.S. states) lose about half their pension wealth, which is a stiff penalty indeed. With 21st century workers being increasingly mobile (Hess, 2009), it should not be surprising that teacher age is negatively correlated with DC preference, with younger teachers preferring DC or hybridized plans that offer elements of both DB and DC plans (Goldhaber & Grout, 2016). However, this does not mean either age group is particularly knowledgeable about pensions or investing.

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<sup>8</sup> Emphasis on “young” is necessary because failing to meet the 33-year requirement would be of little consequence to someone who started working for an FRS employer at Age 32 or older, as they would still be able to begin receiving their pension due to virtue of reaching Age 65. The lag between separation from FRS employment and onset of benefits is the prime reason for the financial losses I am describing.

<sup>9</sup> Or perhaps, bronze handcuffs, as teacher pensions pale in comparison with the golden handcuffs and golden parachutes given to high-earning corporate executives and public-sector or non-profit administrators to which they are associated with.

***Slashed benefits.*** A final downside for new teachers is that there have recently been widespread actions to reduce benefits for new teachers due to funding shortfalls. Chingos and West (2015) summarize:

[During 2008–2012], forty states have taken steps to address funding shortfalls in the traditional DB pension systems in which their teachers participate . . . twenty-two states reduced or eliminated COLAs [cost of living adjustment, also known as inflation adjustment] for benefit payments, twenty-five raised their retirement age, twenty-seven increased the amounts teachers are required to contribute to the pension fund from their salaries, and fully forty raised employer contribution rates. (p. 219)

Overall, these actions represent a pay cut for new teachers, particularly given that teacher pay is also declining relative to other workers (Allegretto & Mishel, 2016).

**FRS and teacher plan choice.** In 2001, the Florida legislature introduced a DC option to the FRS alongside the existing DB (pension) option, borne out of legislation conceived prior to the 2000 bursting of the dot-com bubble that was designed to attract workers who would prefer to chase performance by directing their own investments in a DC plan rather than consign themselves to the predictable returns of a DB plan (Chingos & West, 2015; cf. Bogle, 2009). Because having a choice between a DB and DC retirement plan is unusual, this has facilitated research of teacher choice and demographics. Chingos and West (2015), in looking at FRS data from 2003 to 2009, found that nearly a third of new teachers took the step of choosing the DC plan despite it not being the default option, contrary to pension advocates' claims that teachers strongly prefer DB plans. Teachers specializing in math or science or who possess advanced degrees were more inclined to choose the DC option, suggesting that employer demand and expected upward career mobility is associated with a desire to avoid being locked into a pension

plan. Unsurprisingly, attrition among DC choosers is far higher, although determining causality is elusive because a subset of DC choosers may make the choice knowing in advance they are unlikely to work in Florida for eight years (the vesting requirement in the DB plan), whereas another subset may be more inclined toward attrition because of the reduced cost from having chosen the DC plan in the first eight months of their teaching tenure. Although the idea that teachers may prefer DC or hybridized plans is controversial (cf. Morrissey, 2017), research in other states is consistent with Chingos and West's (2015) findings in Florida (e.g., Clark et al., 2016; Ettema, 2011).

Chingos and West (2015) go on to explain that in the FRS, DC participants' employer contributions vest after one year (presently 3.3% of salary), but DB participants' pensions vest after eight years. A teacher who leaves the FRS between Years 1 and 8, never to return, is entitled only to a refund of their 3.0% employee contribution if enrolled in the DB plan, but is entitled to retain both the employer 3.3% contribution and employee 3.0% contribution if enrolled in the DC plan, for a combined total of 6.3% of salary (Florida Division of Retirement, 2018). Although the state contributes 6.2% to the pension fund rather than 3.3% to the employee's DC plan if the employee chooses the DB plan, the employee never realizes benefits from the 6.2% employer contribution unless they work at least eight years; however, DB attrition during Years 1–8 benefits other DB recipients<sup>10</sup> and the pension fund's solvency as a whole, as the contributions are forfeited to the fund. Notably, Chingos and West (2015) did not mention

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<sup>10</sup> Such benefits are indirect and may come with a time lag. If the pension fund has less of a funding shortfall thanks to attrition of DB choosers before vesting, the Florida legislature is less likely to enact unfavorable changes to pension benefits to narrow the shortfall.

the FRS's educational efforts (<https://www.myfrs.com>), which may imply they are not reaching a broad audience and therefore many teachers are not benefiting.

**Teachers' erroneously low perceived value.** Brown and Larrabee (2017) find that 88% of public sector employees rank retirement benefits as "extremely important" or "very important" when choosing a job. However, this may have been subject to social desirability bias or a framing effect; it contrasts starkly with Fitzpatrick's (2015) empirical study which found teachers only value pension benefits at 20% of their final inflation-adjusted value, indicating that teachers substantially overvalue salary and undervalue DB plan benefits (see also Brown et al., 2019). In part, from the fact that teacher pension plans continue to be slashed across most U.S. states without any commensurate increase in salary (Chingos & West, 2015), it can be reasoned that teachers do not perceive much value in their pension plans (Fitzpatrick, 2015), perhaps due to steep delay discounting (Sourdin, 2008). This is regrettable. It is reminiscent of the infamous longitudinal study of children who were able or unable to pass the marshmallow test to "turn one marshmallow into two" (Murray, Theakston, & Wells, 2016, p. 34) by merely waiting a few minutes, with the impatient children being remarkably *less* successful throughout their lives (Watts, Duncan, & Quan, 2018). When sharing my ideas with a professor from Purdue University at a recent academic conference, he lamented that Purdue previously offered a highly generous 14% employer retirement contribution to faculty and administrators, but found themselves uncompetitive on salary because applicants did not correctly value this benefit (M. Ohland, personal communication, March 31, 2019). This prompted Purdue to increase salaries but reduce the 14% employer contribution and offset the reduction with a mandatory 4% *employee* contribution (Purdue University, n.d.), which has substantial tax disadvantages that are accentuated because Indiana, unlike Florida, collects state and county income taxes, which sum



to a flat rate of 4.33% in Tippecanoe county, where Purdue is located (Indiana Department of Revenue, 2019).<sup>11</sup> Overall, the ramifications of educators' failure to understand or appropriately value retirement benefits are malignant and objectionable.<sup>12</sup> Albeit, one possibility is that they believe, explicitly or implicitly, that the benefits will not in fact be paid out.

### **Counterparty Risk**

Pension benefits offer a defined monthly benefit for one's entire retirement, but there is a risk that the pension guarantor will renege on their obligations (Lahey & Anenson, 2007). Another risk is that politicians will cancel or scale back benefits (e.g., MyFRS, 2011; Snell, 2012), although typically they cannot do so for existing employees, at least with respect to the pension credits they have already accumulated. If a public pension system has substantial unfunded liabilities, counterparty risk (specifically, risk of default; Broeders, 2010) increases because the pension fund or government may go bankrupt, thereby discharging a portion of their liability (e.g., Puerto Rico's proposed 8% cut for pensioners receiving over \$1,200 per month; Bradford, 2019). Florida's pension fund is 83.9% funded as of July 1, 2018 (Florida Division of Retirement, 2018), which is better than many other states. Funding is calculated based on pension plan assets divided by actuarial projections of future required payouts. A higher level of funding reduces counterparty risk to plan participants, with funding greater than 100% being ideal. Overall, counterparty risk, at least with respect to the FRS, is smaller than the risk that an

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<sup>11</sup> This conversation is shared with permission (M. Ohland, personal communication, April 27, 2019). Also, I am grateful for corrections Dr. Ohland provided to my description of Purdue's retirement scheme.

<sup>12</sup> I contend that this degree of pugnacity, even in academic discourse on financial capability and retirement behavior, is warranted. Soft spoken, wishy-washy appeals to financial literacy education command little salience, and are wholly out of place in the face of egregious misconduct such as failing to contribute up to the employer 401(k) match when you are vested and older than Age 59.5, and could, in fact, immediately withdraw the free money (passing up "\$100 bills on the sidewalk"; Choi et al., 2011).

employee managing DC accounts would mismanage or underfund his or her retirement (Benartzi & Thaler, 2002, 2007). Furthermore, an FRS plan is just one part of one's retirement plan, along with Social Security benefits and potentially other accounts such as a 403(b) plan or an IRA.

**As perceived by teachers.** Although counterparty risk may not rationally be much of a concern, subjectively, it is a source of consternation for many teachers. Particularly for teachers who worked through the Great Recession, counterparty risk is not an abstract, nebulous concept, but rather concrete, tangible, and even terrifying. Ettema's (2011) focus group interviews of Tennessee pre- and in-service teachers demonstrate this concern about counterparty risk, such as in the following emotional quotations from interview participants:

- “I think in the long run it [DB risk] might also be on the employee given the potential collapse of the market, you know or whatever, inflation of the dollar over the next twenty years, who knows.” (Ettema, 2011, p. 101)
- I feel like the people in our generation have been trained not to expect for (Social Security) to be there . . . my biggest worry with the pension system . . . it is going to kind of have the same types of problems so it's hard for a teacher to really rely on that being there. (Ettema, 2011, p. 101)
- I have real worries that social systems like this are going to fall through in our lifetime . . . that could end up with teachers losing pensions and with state employees losing pensions, and that would be horrifying to happen when we're thirty-eight or something and have been teaching for however long, however many years. (Ettema, 2011, p. 100)
- The thing that makes me nervous is that schools are failing right now and being closed, and so if I have a plan that is entirely reliant on the school managing my retirement funds

what happens if the school closes or the district becomes bankrupt or something like that?

(Ettema, 2011, p. 100)

These counterparty risks are a real concern that, alongside a desire for locational or employer mobility (Hess, 2009), may drive individuals to select a DC plan wherever DB–DC choice is available (Ali & Frank, 2019; Chingos & West, 2015). As the final Ettema (2011) quotation above alludes to, a teacher also has to consider the risk of being unable to vest or reach full retirement age in a DB plan due to being involuntarily terminated. With DC plans, which vest sooner and offer greater employee control (Hansen, 2010), these concerns are diminished. Nonetheless, DB plans may be of greater financial value than DC plans for a majority of teachers (Rhee & Joyner, 2019), and so a preference for DC plans, whether it be due to concerns about counterparty risk (Broeders, 2010; Hess & Squire, 2010) or a desire for mobility and portability, may be indicative of a financially unwise overemphasis on loss aversion rather than a rational cost–benefit analysis.

### **Teacher Retirement Preparedness**

Lusardi and Mitchell (2007) explained that economists and other researchers are exploring why “so many households arrive close to retirement with little or no wealth” (p. 35). Their review of literature showed that “young and older people in the United States and other countries appear woefully under-informed about basic financial concepts, with serious implications for saving, retirement planning, mortgages, and other decisions” (p. 35). This lack of competence impedes both day-to-day financial decisions and long-term financial outcomes—most notably a well-funded retirement.

Teachers are generally no more informed about financial or retirement issues than others, with limited exceptions for mathematics and economics teachers (Way & Holden, 2009). For

many teachers, retirement preparedness hinges on pension plans that are increasingly underfunded and consequently are scaling back benefits for new workers and earned service credits on a forward-looking basis (Hansen, 2008, 2010). For example, Florida scaled back its pension plan effective July 1, 2011, which had significant negative ramifications for both preservice and in-service teachers (MyFRS, 2011; Snell, 2012). Paychecks after this date have a mandatory 3.0% deduction to fund one's DB or DC plan and new service credits do not earn a cost-of-living adjustment, although prior service credits are grandfathered. For new workers, the DC employer contribution decreased from 9.0% to 3.3%, the DB requirements for full retirement age increased from 30 years worked or Age 62 to 33 years worked or Age 65, the DB vesting period was extended from six to eight years, and the DB salary calculation increased to eight years from five,<sup>13</sup> which negatively impacts workers who choose the DC plan, retire early, change job sectors or move prematurely, or receive their highest salaries toward the end of their careers, respectively. Because of unfavorable changes that are occurring across the country (Snell, 2012), teachers can no longer rely solely on their retirement benefits package for income in retirement.

In addition to state-sponsored DB or DC retirement plans, teachers have access to 403(b) plans where they can deposit a salary percentage of their choosing on a tax-advantaged basis. These accounts are similar to 401(k) accounts, yet lack key protections that the Employee Retirement Income Security Act of 1974 affords to 401(k) accounts. The result is that 403(b) accounts are managed "hands-off," so to speak, by teachers' employers, and are permitted to

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<sup>13</sup> Because most workers earn their highest salaries at the end of their careers, increasing the lookback period from five to eight years results in lower DB benefits because it adds three earlier years to the calculation, during which the worker likely earned less. It also discourages spiking, where a worker takes on overtime hours or a higher-paying role to inflate DB benefits, as each highest paying year is now only 12.5% instead of 20.0% of the salary component of the DB benefit calculation.

aggressively market inferior financial products directly to teachers, such as variable annuities and insurance schemes (Clark & Richardson, 2010). This can end up costing in-service teachers hundreds of thousands of dollars in unrealized gains, undermining their retirement preparedness (Mercado, 2018). Although the FRS is mandatory and separate from optional 403(b) participation, teacher knowledge and expertise in 403(b) and other elective DC plans is important toward supplementing their retirement income.

### **Wage and Benefit Gaps**

The importance of learning about retirement planning is heightened for today's preservice teachers over past generations, because they are likely to teach for less pay (on an inflation-adjusted basis) and less generous DB or DC retirement plans than the prior generation of teachers. In 1994, teacher wages were 1.8% lower than other comparable workers, but this gap widened to 17% in 2015, and even when factoring benefits into the analysis, the gap was still 11.1% in 2015 (Allegretto & Mishel, 2016). Moreover, tuition and living expenses have increased for many undergraduate students who also have less funding available than prior cohorts, resulting in them graduating with unprecedented levels of student loan debt (Moeller, Moeller, & Schmidt, 2016; Podolsky & Kini, 2016). Although a federal program started in October 2007 that allows teachers to discharge federal student loan debt after 10 years of service, from October 2017 to June 2018, 99% of 33,000 applications for debt forgiveness were denied (U.S. Department of Education, 2018), because of onerous and ongoing recordkeeping and annual form submission requirements that qualifying public service workers must comply with throughout the 10-year period. In addition to these issues, many financial products have also become more complicated and laden with pitfalls over the past decades (Braunstein & Welch,

2002). Taken together, these factors are a perfect storm that may disenfranchise the next generation of teachers in retirement.

### **Gender Gap**

Female teachers face significant disadvantages in compensation and retirement wealth due to their gender. In light of the majority of teachers being women, Lucey et al. (2017) remark:

A largely female population, elementary and secondary education teachers represent a group largely under-researched by the personal finance and economics communities. The need to research this group may be supported through findings that women tend to anticipate greater income disparities at retirement than men. (p. 53)

Lusardi and Mitchell (2008) investigated women's outcomes in retirement planning and financial literacy, finding that women tend to invest in an overly conservative manner as compared with men. Farrell's (2009) dissertation dealt specifically with investment preferences among teachers in Florida, and found that both women and Blacks invest less aggressively than men and Whites. Over long timeframes, this reduces wealth considerably. The greatest reduction in Farrell's (2009) research was for Black women as compared with White men, who earned 7.3% annually as compared with 7.7%. Over 30 years, this leads to Black women having 8% less retirement wealth than White men, and for women in general as compared with men, 4% less wealth (Farrell, 2009). This is coupled with other financial disadvantages women face, such as a tendency to incur greater finance charges and late fees on credit card debt (Mottola, 2013).

Allegretto and Mishel (2016) researched the U.S. teacher pay gap, finding that teachers' salaries were 17% lower than other comparable professions in 2015, as compared with only 1.8% lower in 1994. When they accounted for the greater benefits teachers tend to receive in terms of retirement benefits, health insurance, et cetera, the gap as of 2015 narrows to 11.1%. Considering

that most teachers are female, if we are to couple this finding with Farrell (2009), we might predict approximately 15% lower retirement wealth for women as a whole, and approaching 20% for Black women, which results in a noticeably lower standard of living.

Mandel and Semyonov (2014) examined earnings data from 1970 to 2010 and found that although the gender pay gap has narrowed, progress toward closing the gap in the public sector ceased around 2000, with gender segregation remaining the second biggest reason for women's lower wages—that is, certain jobs that pay better have a higher proportion of men. This can be seen clearly among school superintendents, of which only 18% are women, and even the career pathways that lead to being a superintendent are gendered, with women reaching the position through teaching-centered roles whereas men arrive through roles of increasing power over other teachers and staff, finances, resources, and policies (Kim & Brunner, 2009). The largest reason for the gender pay gap is fewer hours worked (Mandel & Semyonov, 2014), which for women often relates to a “second shift” of uncompensated childcare and home-related work not borne by men (Frejka, Goldschieder, & Lappegård, 2018), but also to institutionalized discrimination, employment gaps, and prioritization of a male partner's career.

The vast majority of DB calculation formulas incorporate both salary and years of tenure as multiplicative factors, including the FRS (Florida Division of Retirement, 2018). Even if the FRS DC option (investment plan) is chosen, contributions are directly related to one's salary with 6.3% contributed. Consequently, the gap in gender pay disadvantages female teachers in at least two ways: lower benefits due to lower pay and fewer years of service credits, and if investment selections are made (such as in a DC plan), a gap in returns from reduced exposure to equities (Farrell, 2009; Lusardi & Mitchell, 2008). Together, these result in lower income for female teachers, both in retirement and throughout one's career. This warrants research on

gender differences regarding anticipated financial challenges in retirement among preservice teachers, who are approaching the outset of their accumulation phase in the retirement lifecycle.

## **Teacher Knowledge of Economics and Finance**

### **Economics Knowledge**

Whereas financial literacy focuses on the individual's knowledge and ability to make financial decisions to his or her benefit, economics is a discipline that studies how economies—systems of trade of goods, currencies, and services—function, at both the macro and micro levels. There is a lengthier history of research into the economics knowledge of teachers than specific knowledge relating to personal finance, and it warrants consideration because the two are related. McKenzie (1971) studied in-service elementary teachers in Virginia with a mean of nine years' experience, by administration of an economics quiz. McKenzie found that those who had taken an economics course performed significantly better, even if the course was completed more than four years prior, and in fact such elementary teachers were not significantly less knowledgeable than high school social studies teachers who deal with economics in the curriculum more frequently. However, on a criterion- rather than norm-referenced basis, all participants' knowledge of economics was lacking, with only 55% to 65% of questions correctly answered by teachers without economics training compared to those with economics training.

McKinney, Larkins, McKinney, Gilmore, and Ford's (1990) paper, *Preservice Elementary Education Majors Knowledge of Economics*, built on McKenzie's (1971) work by administering another economics quiz to a sample of 133 preservice teachers. They were surprised that only three of 133 participants answered more than 70% of quiz items correctly, and echoed concerns put forth by McKenzie (1970) about the economic literacy of elementary school students, as summarized pithily by McKenzie (1971):



The lack of economic understanding of elementary school children has become painfully obvious. In a recent study conducted by the author, children in the fourth and seventh grades were found to have grossly distorted visions of the economic life around them. Many thought that the prices of most things they buy are controlled by God, that the government owns most of the nation's factories and stores and rations such things as bubble gum, that everyone would be better off if each individual "had a machine which could print money," and that a new house can be purchased for as little as \$100. (p. 30)

Although the above quotation deals with elementary school pupils rather than teachers, a strong argument can be made that economics and financial education should start in elementary school in order to educate students *and* future generations of teachers. In service of advancing at least the former goal, initiatives such as the Jump\$tart Coalition for Personal Financial Literacy's standards handbook proposes what financial concepts and skills should be taught in Grades K–12 (Jump\$tart, 2015). However, broad implementation of such initiatives has not occurred (Council for Economic Education, 2018), and states that have implemented financial education requirements for K–12 students have often done so in an ineffective manner (Mandell, 2006, 2009, 2012; Mandell & Klein, 2009). This is a shame, as a recent study by Swinton et al. (2010) demonstrated that continuing education in economics for in-service teachers benefits both teachers *and* their students.

Teachers' participation in workshops or continuing education courses in economics has repeatedly been shown to have positive impacts on their students' achievement in economics. A study of Georgia high school economics teachers and students compared student test scores for teachers that attended a series of three professional education workshops with teachers who did not attend (Swinton et al., 2010). The authors controlled for teacher and student characteristics

such as race and poverty, and found that students of the workshop-attending teachers had significantly higher test scores on high-stakes end-of-course exams.

In the same vein, Harter and Harter (2012) explored the question of the impact of two forms of personal finance continuing education for in-service teachers on their students' resultant test scores on a battery of financial knowledge questions. Thirty-seven teacher participants were divided into three groups, one receiving no financial education (control group), one receiving a semester-long graduate course in personal finance, and one attending a brief workshop. Participating teachers agreed to teach economics concepts to their students and administer pre- and post-assessments to their students. The results showed that the two intervention groups' students did significantly better than the control group, but no statistically significant advantage over the semester-long course was found. Consistent with Swinton et al. (2010), Harter and Harter (2012) surmised that brief workshops are more effective in terms of resources, because semester-long professional development courses did not appear to have greater impact on student achievement in either study.

The work of Swinton et al. (2010) and Harter and Harter (2012) built on Walstad and Soper's (1988) research of economics knowledge of U.S. high school students and teacher backgrounds in economics education, the results of which led to an authoritative conclusion: "Teacher coursework in economics improves the economic knowledge of students" (p. 254). Other research with rigorous quasi-experimental study designs has reached the same conclusion (e.g., Bosshardt & Watts, 1990; Lynch, 1990; Wetzel et al., 1991), at times with the caveat that multiple workshops or courses have a cumulative effect on teacher competence and are necessary to realize statistically significant learning gains among teachers' students.

## **Financial Knowledge**

Teachers' financial knowledge appears to be an important determinant of student financial literacy outcomes, although research in this area is newer and less voluminous than research on broader economics curriculum. Of particular importance is Way and Holden's (2009) seminal paper regarding their online survey of in-service K–12 teachers, which found a universal recognition of the importance of instructing students on personal finance, yet also found a widespread deficit in teachers' training in such areas, with respect to both curriculum and pedagogy. Teachers' self-efficacy for teaching financial topics was universally limited, with the least confidence demonstrated in the important yet conceptually complex topics of investing, insurance, and risk management. Another study by Brandon and Smith (2009), of preservice rather than in-service teachers' financial knowledge and teaching self-efficacy, similarly found profound deficits in both areas, which suggests in concert with Way and Holden's (2009) findings that teachers' financial knowledge does not improve as they move through their careers.

## **Implications**

An overall lack of economics and financial knowledge and training among preservice and in-service teachers inhibits both their ability to instruct children in these topics and their ability to effectively manage and understand their retirement plans and investments, and their personal finances at large. Convergent evidence suggests that financial literacy is causally tied to consumer financial outcomes, and that financial education, when effective, can improve financial literacy (Hastings, Madrian, & Skimmyhorn, 2013). The present state of education, financial literacy, and more broadly, financial wellness (Joo, 2008) constitutes a vicious cycle of financial illiteracy along with resultant negative implications for financial wellness and socioeconomic

status, especially for women and minorities (Hershey & Jacobs-Lawson, 2012; Lucey et al., 2017; Lusardi & Mitchell, 2008; Mottola, 2013).

### **Teacher Retirement Plan Preferences**

Here, I will discuss a selection of research relating to teachers' preferences for type of retirement plan, summarized in Table 4. This section primarily concerns preferences for DB or DC plans among in-service teachers, as the research base on preservice teacher preferences is quite small. Generally, DB plans offer a large payoff if one perseveres in the same retirement system for about 25 years or longer and provide security via guaranteed lifelong retirement income, although such benefits have become less generous in recent years (Backes et al., 2016). In contrast, DC plan balances vest quicker, are subject to investing risk, and are more portable including eligibility for rollover to an IRA upon separation from many retirement systems, but come with a different and more numerous set of potential pitfalls (Hansen, 2008, 2010). Younger teachers are more likely than older teachers to prefer DC plans, which is not surprising given the increasingly mobile 21st century workforce (Hess, 2009). The research reviewed herein has been conducted regarding several key U.S. states and topics, and is organized as such—in order of decreasing relevance: Florida, plan type preferences in general, Washington, Utah, and accrual curve preferences.

Table 4

*Research on Teachers' Retirement Plan Preferences*<sup>14</sup>

<b>Work (state/topic)</b>	<b>Summary</b>
Ali & Frank, 2019 (Florida)	Analysis of administrative data of 4,040 Florida International University employees hired since FRS DB–DC choice began in 2001; a notably high 63% opted for the DC plan, with more education predicting DC preference, but age and gender surprisingly had no relationship.
Chingos & West, 2015 (Florida)	Looked at the FRS from 2003–2008 which offered a DB–DC choice, and found that 30% of new teachers selected the DC option even though the default if no selection was made was the DB option.
Clark, Hansen, & Mitchell, 2016 (Utah)	A revision to the Utah retirement system eliminated a DB plan for new employees but offered a hybrid DB–DC plan (the default option) or pure DC plan to new teachers. About 60% made no selection, defaulting to hybrid, whereas nearly half of others chose the DC plan.
Clark & Pitts, 1999 <i>(for perspective; alluded to in Florida section)</i>	New faculty at North Carolina State University have a DB–DC choice. Based on 1971–1988 data and surveys, recency of hiring, younger age, higher salary, and non-tenure track predicted DC selection. Of survey participants, 29% said they did not put much thought into the decision.
DeArmond & Goldhaber, 2010 (Washington)	A 2006 survey of teachers in the state of Washington, which offers DB and hybrid options, found only 46% in the hybrid option understood their plan, and that 49% would prefer putting money into a DC plan versus only 26% for a DB plan (26% were unsure).
Ettema, 2011 (plan type preferences in general)	A video explained DB, DC, and hybrid plans, and then teachers selected which plan(s) they would contribute 10% of their salary to with a 10% employer match. Results were DB = 29%, DC = 25%, hybrid = 22%, mix of plans = 24% (p. 82), which showed a diversity of preferences.

<sup>14</sup> Two references (Lucey & Norton, 2011; Yu, 2011) are omitted from this section because they are included in a subsequent section specific to preservice teachers.

<b>Work (state/topic)</b>	<b>Summary</b>
Goldhaber & Grout, 2016 (Washington)	Younger teachers in the state of Washington prefer the hybrid DB–DC plan to the pure DB plan; older and more educated teachers contribute a higher percentage of salary; DC contributions are on par with private-sector workers and retirement security was equivalent for both plans.
McGee & Winters, 2019 (accrual curve preferences)	Asked teachers if they prefer the smooth accrual curve of a hybrid, cash balance plan or the jagged, back-loaded curve of a traditional DB plan that favors retiring around 30 years of service; new teachers, particularly those who were risk averse, strongly preferred the former.
Smith, 2012 (plan type preferences in general)	Survey of California in-service teachers on retirement knowledge, satisfaction, and preferences showed that teachers with more than 15 years of service preferred DB plans and had greater retirement knowledge and satisfaction, whereas newer teachers were less satisfied, more likely to prefer DC plans, and more in favor of systemic overhaul.

### **Florida DB–DC Choice**

Chingos and West’s (2015) research was especially relevant for studying FRS teacher plan choice. Even with the default option being the DB plan, nearly a third of teachers ended up enrolling in the DC plan. Notably, Hispanics and African Americans were 12% less likely than Caucasians to select the DC plan, which the authors interpreted as showing a risk preference among minority teachers for DB plans. Teachers with advanced degrees, math or science specialties, and those working in FRS-participating charter schools were more likely to prefer the DC option, which may imply they did not want to be shackled to the FRS due to their skills being in higher demand—even teachers who do not move between states could end up leaving the FRS for employment in private schools or other non-FRS-participating institutions.

Chingos and West (2015) only analyzed FRS data from 2003–2008, but in 2011 a host of unfavorable changes were made to both the DB and DC plans (MyFRS, 2011; Snell, 2012). At

this time, the employer funding rate for DC plans decreased from 9.0% to 3.3% of salary, which was arguably worse than the changes made to DB benefits. Nevertheless, the FRS DC plan is perennially popular, with 124,788 (19.4%) of 643,333 FRS members enrolled as of June 30, 2018 (Florida Division of Retirement, 2018). In fact, between 2017 and 2018, DC membership increased 6.1% while DB membership *decreased* 0.3%, and between 2016 and 2017, DC membership increased 2.8% while DB membership only increased 0.8% (Florida Division of Retirement, 2017, 2018).<sup>15</sup> Based on these statistics and other research (e.g., Clark et al., 2016; DeArmond & Goldhaber, 2010), the putative conjecture that teachers overwhelmingly prefer and are best served by DB plans (Morrissey, 2017) appears to be divorced from reality.

Ali and Frank's (2019) analysis of administrative data for 4,040 FRS-enrolled Florida International University (FIU) employees hired since FRS DB–DC choice was implemented in 2001 reveals several interesting findings. First, although DC preference rates seen among Florida K–12 teachers were 30% in Chingos and West's (2015) research, which is surprisingly high when contrasted with pension advocates' claims that teachers roundly prefer DB plans (Kimball et al., 2005; Morrissey, 2017), at FIU, DC preference constituted a supermajority—63% of employees elected to switch, compared with only 37% sticking with the default option of the FRS DB plan. Like most universities, FIU's workforce is more highly educated than K–12 teachers, with 29% having attained Master's degrees and 26% possessing doctoral degrees. Although educational attainment and financial knowledge have consistently shown positive

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<sup>15</sup> The 2016–2017 fiscal year statistics are remarkable given that since the DC plan's introduction in 2001, the DB plan was the default option and new workers had to go out of their way to switch to the DC plan. The even greater popularity of the DC plan in the 2017–2018 fiscal year is partly explained by the fact that at the year's midpoint, January 1, 2018, the default option for new workers switched to the DC plan. Note that FRS statistics include not just teachers, but many other public workers such as police officers.

correlations (e.g., in National Financial Capability Study data; Thripp, 2017), the finding of such a strong preference for DC plans among those with advanced degrees suggests a high value placed on job mobility (Hess, 2009), even among tenure-track or tenured professors. In fact, in the FIU sample only 23% of those with less than a Bachelor's degree chose the DC plan, as compared with 59%, 74%, and 85% for those having attained a Bachelor's, Master's, and doctoral degree, respectively. This aligns with an older study by Clark and Pitts (1999) on DB–DC preferences among faculty at North Carolina State University. However, two contrarian findings that emerged from Ali and Frank's (2009) analysis are that age was not a factor in DB–DC preference (cf. Smith, 2012), and women were not more likely to prefer DB plans (cf. Frank, Gianakis, & Neshkova, 2012). Finally, a seductive detail: Based on interviews with Human Resources staff, DC portability was seen as paramount, whereas concerns about a spouse receiving half of a DC plan balance in a potential future divorce was irrelevant to employees' DB–DC preferences (as was the option to take a loan from one's DC plan and desires to bequeath; Ali & Frank, 2019).

### **Plan Type Preferences in General**

The dissertations of Ettema (2011) and Smith (2012) included a focus on plan type preferences in general, not in relation to a specific state's plan structure. Although their research was conducted in Tennessee and California, respectively, both states only offered DB plans at this time and therefore the preference questions asked of pre- and in-teachers were not in relation to a potential DB versus DC choice in their state of study or employment.<sup>16</sup>

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<sup>16</sup> Note, however, that subsequent to Ettema's (2011) work, Tennessee replaced their DB plan with a hybrid DB–DC plan for new hires after July 1, 2014 (Tennessee Department of Treasury, 2019).



Ettema (2011) complained that “little is known about the actual pension preferences of individual teachers” (p. 36). As seen in Table 4, the situation has improved since 2011, with the emergence of a handful of new studies that coincides with the rising prominence of DC plans in the public sector (Rhee & Joyner, 2019). In part, the lack of research on DB–DC preferences may have been due to the fact that until recently, actual teachers having a DB–DC choice was rare or unheard of—Ali and Frank (2019) remark that “the empirical literature on public sector determinants of pension choice is limited, as the DB model’s predominance . . . constrains real-world assessment of what motivates choice between the two basic model types” (p. 231).

The first part of Ettema’s (2011) research was an analysis of data from the 2003–2004 Schools and Staffing Survey and the 2004–2005 Teacher Follow-Up Survey, which were conducted nationwide in public and private schools by the National Center for Education Statistics, with the latter being a follow-up survey sent to the same respondents. The most striking finding was that teachers respond strongly to retirement incentives; of those who became eligible for regular retirement in a given year, two-thirds to three-quarters chose to do so. Even of those who merely became eligible for early retirement, slightly more than half did so.

The second part of Ettema’s (2011) dissertation involved surveys and focus groups among Tennessee preservice teachers and among in-service teachers who were alternatively certified or taught in urban schools, which focused on retirement knowledge and DB–DC plan preferences. With respect to the latter, reasons for 71% of participants eschewing traditional DB plans included mobility, desired career length, and perceived counterparty risk. These findings align with Chingos and West (2015) and Ali and Frank (2019), and further undermine Morrissey’s (2017) position. Pearson’s chi-squared tests showed that preservice teachers were more likely to prefer cash balance plans (a type of hybrid DB–DC plan) to a statistically

significant degree ( $p = .05$ ), and a strong preference for DC plans was seen among in-service mathematics teachers ( $p = .01$ ) and those with alternative certifications ( $p = .004$ ).

Smith's (2012) survey of 212 California in-service teachers contrasted with Ali and Frank's (2019) findings in that teachers with more than 15 years of service favored DB plans, although this aligns with a long history of prior research (e.g., Goldhaber & Grout, 2016). Newer teachers had a lower level of retirement satisfaction and favored radically changing existing plan structures, whereas older teachers favored retaining the status quo. Given that pension systems have been slashing benefits for new hires at an alarming rate (Backes et al., 2016; Chingos & West, 2015; MyFRS, 2011; Snell, 2012), it should not be a surprise that newer teachers are disenchanted with traditional DB systems. This complements Ettema's (2011) research on risk, control, and trust, which showed that many current and future teachers in Tennessee were concerned with counterparty risk (Broeders, 2010) regarding future DB payouts.

### **Washington State DB or Hybrid Choice**

This item from the 2006 Washington State Teacher Compensation Survey was timely because Washington teachers were then being given a one-time election to continue participating in a DB plan or switch over to a new hybrid DB–DC plan (DeArmond & Goldhaber, 2010):

If you had an extra 10 percent of your current pay to invest in your retirement, would you prefer to put that money into a Defined Benefit plan (e.g., traditional pension) or a Defined Contribution plan (e.g., a 401(k) or 403(b))? (p. 570)

Respondents to this item ( $n = 2,843$ ) preferred DC contributions (49%), with equal smaller proportions (26% each) preferring DB contributions or selecting “unsure” (DeArmond & Goldhaber, 2010). One potential concern regarding this item is that defined benefits are typically defined by a formula that includes a multiplier, average salary in highest  $n$  years, and years of

service, which notably lacks any sort of investment component (Hansen, 2010). Consequently, it is not immediately clear how one could “invest” additional money for retirement within such a scheme. The Washington State Teacher Compensation Survey includes a series of three questions that partially address this deficiency, centered around this prompt: “Imagine that you have 20 more years left before retiring from teaching. If the state offered you the following options for a holiday bonus, which one [of two] would you prefer?” (DeArmond & Goldhaber, 2010, p. 572). On the left, the choice for all three questions is “an extra \$10,000 that you will get in your first pension paycheck when you retire,” whereas on the right, the choices are “an extra [dollar amount] that you will get in your next paycheck,” with amounts of \$2,100, \$3,100, and \$4,500, corresponding with discount rates (Sourdin, 2008), respectively, of 8%, 6%, and 4% per annum. Data from 2,062 participants revealed gender differences where men were significantly more present-oriented (e.g., inclined to take the lump sum, even when it was only \$2,100 or \$3,100). DeArmond and Goldhaber (2010) hypothesized that future-oriented teachers would tend to prefer DB investing, and by multinomial logit analysis found that teachers who prefer \$10,000 in 20 years over \$4,500 now (discount rate = 4%) were 23% *less* likely to prefer the DC plan as compared with teachers who prefer \$2,100 now over \$10,000 in 20 years. Overall, these results suggest a relationship between future-orientation (i.e., choosing \$10,000 in 20 years over all three sums now) and DB preference, whereas teachers who exhibit stark delay discounting (i.e., choosing \$2,100 now) may be inclined to favor DC plans.<sup>17</sup> A follow-up study by Goldhaber and

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<sup>17</sup> For future-oriented teachers, the marshmallow test comes to mind (Watts et al., 2018); for present-oriented teachers, the maxim “a bird in the hand is worth two in the bush” is pertinent (consider also counterparty risk; Ettema, 2011; and default risk; Broeders, 2010).

Grout (2016) suggested that DC and hybrid contribution rates in Washington were sufficient, providing teachers with equal or better retirement security as compared with the prior DB plan.

### **Utah Hybrid or DC Choice**

Clark et al. (2016) studied teacher retirement behavior in Utah, during a reformation involving a switch from DB plans to DC and hybrid plans. New teachers and other public workers no longer had a pure DB plan as an option, but instead a DC plan or a hybrid plan that offered a combination of DB and DC benefits. Clark et al.'s (2016) most striking finding was that 60% of new hires never logged in to select an option, remaining in the default option which was the hybrid plan.<sup>18</sup> In addition, among the 40% who did log in, slightly more than half stuck with the default, hybrid option. Although Clark et al. (2016) did find that subsequent to implementation of the new retirement scheme, attrition rates *increased*, this might in part be due to lower overall compensation that is a common outcome when retirement systems are modified; in Florida, changes made to the FRS in 2011 also significantly reduced benefits for new hires (MyFRS, 2011), without a corresponding increase to salaries. With respect to teacher preferences, the fact that only about 40% bothered to make an election suggests that preferences are overshadowed by propensity to stick with the default choice. This is consistent with nudge theory (Thaler & Sunstein, 2008), which suggests the strong influence and importance of default options (“nudges”) toward favorable or unfavorable financial, health, and happiness outcomes. In this vein, the 60% who did not make an active selection were also significantly less likely to

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<sup>18</sup> Nudge theory (Thaler & Sunstein, 2008) accommodates such lackadaisical retirement plan participants, suggesting that the default option aspire to a fiduciary standard. The FRS does this by defaulting DC members into an age-appropriate target-date retirement fund (Florida Division of Retirement, 2018), which is likely preferable to what they would otherwise select (Benartzi & Thaler, 2002, 2007).

enroll in optional, supplemental retirement plans (although these lacked an employer matching contribution; Clark et al., 2016). This suggests that teachers who do not make the effort to actively select a retirement plan are also unlikely to give adequate care or consideration to their financial wellness in retirement.

### **Accrual Curve Preferences**

McGee and Winters (2019) studied the preferences of teachers toward New York City and Philadelphia’s traditional DB plans which include sharp, unexplained financial incentives to retire at certain points (Costrell & Podgursky, 2009a), as compared with hypothetical cash balance plans where participants earned pension credits evenly (weighted for salary) throughout their career. Teachers strongly preferred the latter system, and those who demonstrated risk aversion overwhelmingly disfavored DB plans. It should be noted that where DC plans are offered, participants can transform them into the equivalent of a DB plan by purchasing a single premium immediate annuity upon retirement, or a deferred annuity in advance of retirement (e.g., 10 years before), which will pay a stable monthly benefit like a DB plan. However, doing so has costs—as an insurance product, annuities have negative expected value, and the buy-in price fluctuates with interest rates and other factors that cannot be foreseen. Therefore, a state-run DB plan is typically much better than what one would receive with an equivalent 401(k)-style DC plan that is annuitized (Rhee & Joyner, 2019). Consequently, offering DB plans with even accruals rather than accruals laden with “peaks, cliffs, and valleys” (Costrell & Podgursky, 2009a, p. 176) is sensible and may be preferred by many teachers, although this idea has received little attention. In sum, this implies that the supposition that back-loaded DB accrual curves are preferred by teachers (Morrissey, 2017) is empirically bereft, and cost–benefit analyses that deem vesting and back-loading necessary to increase retention and reduce turnover

remain a subject of hot debate (in favor, see Kimball et al., 2005; Rhee & Joyner, 2019; in opposition, Aldeman & Vang, 2019; Goldhaber et al., 2017).

### **Summary**

Given the choice, many educators prefer DC and hybrid plans over DB plans, particularly if they are graduate-degree holding university employees, male, or younger (Ali & Frank, 2019; Ettema, 2011; Smith, 2012). Even when teachers have to go out of their way to override default enrollment into a DB plan, they do so in surprising numbers (Chingos & West, 2015), although the default option is strongly favored due to many teachers' inaction (Clark et al., 2016). A rough proxy for DC preference is being present-oriented, inclined to discount future money by 6%, 8%, or even more per year (DeArmond & Goldhaber, 2010), although on the whole, DC participants are not necessarily disadvantaged as compared with DB participants (Goldhaber & Grout, 2016). Many DB plans are back-loaded, with participants accruing little pension wealth in the first two decades followed by a massive spike in the third decade. Many teachers dislike this aspect of DB plans and would prefer DB or hybrid plans that featured a smooth accrual pattern (McGee & Winters, 2019), similar to DC plans. Portability and mobility (Ali & Frank, 2019) are common reasons to prefer DC plans, as well as uncertainty about whether DB benefits will actually be honored (Ettema, 2011). Teachers desire retirement security (Ettema, 2011; Smith, 2012), but being shackled by obtuse rules and "golden handcuffs" (Ali & Frank, 2019, p. 221) may explain their distaste for DB plans, particularly when compounded by widespread reductions in benefits since the Great Recession (e.g., MyFRS, 2011).

### **Retirement Research Pertaining to Preservice Teachers**

Research on preservice teachers financial and retirement knowledge and preferences is limited to a handful of studies (Table 5). The oldest of relevance that I found was McKinney et

al. (1990), who administered the 46-item Test of Economic Literacy to 113 preservice elementary teachers, noting that 52% correctly answered only 21 or fewer items, and only three students had a “passing” grade of 70% or higher. Although this test focused on micro- and macroeconomic issues rather than financial literacy, there is conceptual overlap between the two. McKinney et al. (1990) argue that the results are indicative of a lack of economic knowledge and civic engagement that persists inter-generationally from teachers to their students.

Table 5

*Research on Financial and Retirement Knowledge and Preferences of Preservice Teachers*

<b>Work</b>	<b>Summary</b>
Brandon & Smith, 2009	Study of preservice teachers’ financial knowledge and self-efficacy found being older than 25 and married predicted financial knowledge; participants self-efficacy for teaching about credit and mortgages was mismatched with their actual knowledge
Ettema, 2011	Found that preservice teachers know little about retirement plans and that 71% of pre- and in-service participants preferred alternatives to DB plans; noted a lack of research on teacher retirement preferences among both pre- and in-service teachers
Henning & Lucey, 2017	Surveys of faculty and preservice elementary teachers revealed that both groups overwhelmingly felt unprepared to teach financial literacy but a majority felt it was at least somewhat important
Lucey, Meyers, & Smith, 2017	Educational interventions on in-service teacher retirement and investing knowledge, both computer and face-to-face, produced significant learning gains, which suggests preservice teachers could benefit similarly
Lucey & Norton, 2011	Survey of preservice teachers retirement understandings found a widespread lack of familiarity with various types of retirement plans, terminology, and concepts, and uncertainty about future retirement

<b>Work</b>	<b>Summary</b>
McKinney, Larkins, McKinney, Gilmore, & Ford, 1990	Persuasive/empirical article; authors administered economics knowledge test to 113 preservice elementary teachers with poor results and argued students' lack of knowledge stems from teachers
Smith, 2012	Survey of in-service California teachers revealed that among 212 participants, 64% agreed or strongly agreed that "starting teachers should be able to expect the same type of benefits I have," which is not the case in many states, such as Florida
Tanase & Lucey, 2017	Solicited open-ended written responses from preservice teachers regarding interdisciplinary connections around financial literacy; only a small minority of participants alluded to the benefits of financial literacy in a broad context that included social justice
Yu, 2011	Dissertation on motivations for choosing the teaching field found that although money does not motivate preservice teachers, a secure retirement via a generous pension was a motivator

### **Knowledge Gap and Plan Preferences**

Teachers tend to lack not only economics knowledge, but retirement knowledge as well. This makes it difficult for them to understand different retirement plans or know which best fits them. Ettema's (2011) dissertation looked at teacher retirement preferences, noting that:

Little is known about the actual pension preferences of individual teachers. It is possible to determine, given certain information about an individual teacher, what sort of retirement plan would be most beneficial to that individual, but we do not know if teachers are aware of this. In order for a teacher to make an optimal decision (if she in fact has a choice), she must understand the different types of plans available- no easy task. (p. 36)



Intrinsically, whether a teacher is better served by a typical DB or DC retirement plan requires predicting how long he or she will persist in working under the same retirement system. This may be difficult even for oneself to predict. Ettema's (2011) research included focus groups with both pre- and in-service teachers, finding that preservice teachers most commonly selected "nothing" as their level of knowledge of retirement plans, but that in-service teachers knew more. However, this knowledge was acquired during their career, primarily from discourse with colleagues and from annual retirement plan statements. Preservice teachers' knowledge was distressingly low, as evidenced by the following participant quote:

I know there is some sort of pension that you can put into but I don't know how it works, how much it is, how long you have to teach to get it, or if it even exists anymore with the new budget changes. (Ettema, 2011, p. 85)

This lack of knowledge bodes poorly for preservice teachers' future retirement and also suggests that the value of pension plans as a recruitment tool into the general field of teaching may be limited. In fact, Ettema (2011) also found that 71% of participants preferred DC or hybrid plans to pure DB plans, which suggests that newer teachers may be more concerned with career and geographic mobility (Goldhaber et al., 2017) and/or that they perceive the existence of counterparty risk in traditional DB plans.

Lucey and Norton (2011) provided support for Ettema's (2011) qualitative results via a quantitative survey of preservice teachers' understanding of retirement concepts. They found a pervasive lack of knowledge of types of retirement plans, types of investment products, and terminology such as load fees and pretax contributions. In addition, participants were uncertain about their financial wellness in retirement (even though it is still 3–4 decades away)—on a scale of questions on anticipated financial challenges in retirement, the mean response was "neutral"

on Likert items for whether preservice teachers anticipated having to work in retirement and whether they want to save for retirement but believe their salary will be too low to do so. This indicates that many participants, who have not yet even begun to teach, are already anticipating difficulties in funding their retirement and retiring at a reasonable age.

### **In-Service Teacher Attitudes Toward Retirement Benefits for Future Teachers**

Although preservice teachers may know little about retirement plans in their career field, in-service teachers have opinions on how retirement benefits for the next generation of teachers should function. Smith (2012) surveyed in-service teachers primarily on their retirement and financial issues, but included three questions that asked about what in-service teachers believe is appropriate for future teachers. Nearly two-thirds of participants agreed that the “type” of benefits they will receive should also be enjoyed starting teachers, which implies a similar benefit level as well as type of benefits. Many states, however, have reduced benefits for new teachers, including Florida in 2011 (MyFRS, 2011; Snell, 2012), and there has also been a move toward replacing DB plans with DC plans (Hansen, 2010). Participants strongly disagreed that teachers who start later in life should receive the same benefits, but 59% agreed that teachers who start after Age 40 should be able to buy service credits in their pension plan. This could be conceptualized as either a lump-sum purchase or an ongoing payroll deduction. With respect to Florida, this may show a lack of alignment between what teachers want and what the state provides—the state slashed new and in-service benefits in 2011 (MyFRS, 2011), and there is also no option to increase one’s contribution to either the FRS DB or DC retirement plans.

### **Motivation for Choosing Teaching Career**

What motivates individuals to choose teaching as a career? Although there are many factors with altruism being a potential key factor (Serow, 1993), the desire for a secure pension

in retirement attracts certain teachers. Yu's (2011) qualitative research showed that although pay was not a motivating factor for selection of a teaching career, the desire for a retirement pension motivated several participants, such as Kevin:

(Retirement is) One of the biggest reasons I went into teaching. And this was before the stock market crashed, it scared me to death to save for my retirement. . . . It scared me to death to think that [\$40,000 of savings] was my only retirement, and I really, really wanted a public pension. So when I was weighing my options, that was honestly one of the biggest things that I considered. It reaffirmed my decision. And actually, I'm such an accounting dork, that I've been researching pensions in all the states slowly that I would want to live in, potentially, to teach versus the salary and all that, and just to see like where I want to live. (pp. 209–210)

Despite a widening salary gap (Allegretto & Mishel, 2016), teacher retirement benefits remain more generous on average than private-sector work. They also function as a commitment device; they cannot typically be tapped until retirement age (Sourdin, 2008; Thaler, 2016; Thaler & Benartzi, 2004), or if they can be liquidated there is typically a large tax penalty.<sup>19</sup> Therefore, those who seek the security of a retirement pension despite a modest salary may be recognizing their own behavioral foibles that might lead one to spend a higher salary immediately, saving nothing for retirement, if they were to trade their pension plan for a salary increase of equivalent value by working in a different field (Benartzi & Thaler, 2007; Thaler & Sunstein, 2008).

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<sup>19</sup> Although DB plans typically cannot be liquidated, an exception is that Illinois teachers who quit before retirement age can take their benefits as a lump sum. Males, African Americans, and Hispanics are more likely to do so, which could have disastrous consequences in retirement when coupled with the fact that Illinois opts out of Social Security (Lueken & Podgursky, 2016).

## **Interdisciplinary Connections**

Financial literacy is a component of an overall conception of personal financial wellness that considers not only one's knowledge, but also one's ability to apply that knowledge and one's lived financial situation (Joo, 2008; Montalto et al., 2019). Individual financial wellness, at a wider scale, is important to the overall function of economies (Lusardi & Mitchell, 2014). McKenzie et al. (1990) advocated that preservice teachers be educated in economics, contending that economic knowledge requires instruction and is important toward one's "civic duty in a democracy" (p. 3), as well as individual financial decisions. Congruent with this holistic viewpoint, Tanase and Lucey's (2017) qualitative research asked preservice teachers to connect personal finance and mathematics with social justice. They rationalized that mathematical expertise is essential to success in the world, and that financial literacy can lead one to prosperity, along with the many positive outcomes that come with improved socioeconomic status. Unfortunately, they found that most preservice teachers struggled to convey any broad implications for financial and quantitative literacy, with only 10% demonstrating broad, interdisciplinary conceptions that connected social justice with either area. They surmised:

The shallow conception and portrayal of mathematics teaching as a dull and monotonous process that involves shallow interpretations portends an ominous future for a citizenry that lacks vision of these relationships and cannot articulate the mathematical truisms that describe patterns of social injustice. (Tanase & Lucey, 2017, p. 12)

Overall, this is indicative of a gap in education that manifests as a narrow conception of mathematical applications, and as a general lack of education on financial topics.

## **Education Gap**

As a whole, financial literacy is a topic that both teachers and teacher educators feel unprepared or under-qualified to teach, but both groups recognize its importance. In surveys administered to teacher education faculty with expertise in financial issues and to preservice elementary teachers, Henning and Lucey (2017) found that 75% of faculty and 88% of preservice teachers lacked confidence in teaching financial topics (see also Way & Holden, 2009; Lucey, 2016), but 75% of faculty and 59% of preservice teachers felt it was at least “somewhat important” for preservice teachers to be trained to teach financial literacy. This gap between high perceived importance and low perceived confidence is important, has existed at least since the Great Recession, and continues to persist (Lusardi, 2019).

Brandon and Smith (2009), echoing McKenzie et al. (1990), purported that “prospective teachers’ ability to effectively facilitate the increase in students’ financial knowledge depends, to a great extent, on their level of financial knowledge” (Brandon & Smith, 2009, p. 14). This suggests, quite intuitively, that the education gap is a vicious circle that persists, in part, because teachers need to be competent regarding personal finance in order to teach it. Brandon and Smith (2009) surveyed 99 preservice teachers and found that younger, unmarried preservice teachers were particularly bad at personal finance, whereas the overall knowledge of the entire sample was no better than the typical American. Moreover, there was a perception gap where participants felt most confident about teaching the topic they demonstrated the least knowledge of (credit), but the opposite interaction was seen with mortgages. Attempts to comprehensively address the financial education gap may fail if they do not consider pre- and in-service teacher education, along with including financial education in K–12 curricular requirements (Council for

Economic Education, 2018; Jump\$tart, 2015) and using pedagogical techniques that have demonstrated effectiveness (Fernandes, Lynch, & Netemeyer, 2014; Mandell, 2012).

Regarding a lack of financial knowledge as it pertains to retirement planning, Lucey et al. (2017) administered brief educational interventions on retirement concepts to in-service teachers, which were successful at significantly improving knowledge on a post-test. Consistent with Brandon and Smith's (2009) premise, this suggests merit to beginning to educate teachers on retirement issues before they graduate college. Because preservice teachers will soon transition into teaching, at an age where saving for retirement and making good financial decisions can have the most impact on compounding returns over the longest possible timeframe (Panyagometh & Zhu, 2016; Williams & Bacon, 1993), the lack of knowledge regarding investing seen by Lucey and Norton (2011) shows an urgent need for financial education of preservice teachers. Presently, however, there are few efforts to do so. Furthermore, as Ettema (2011) opined, research on preservice and early career teachers' retirement preferences is scant. This scantiness includes instrumentation, which prompted Lucey and Norton (2011) to develop a survey of preservice teachers' retirement knowledge. In sum, this suggests a need for further exploratory research on the financial and retirement knowledge and perceptions of preservice teachers, particularly if they will be faced with choosing between a DB and DC retirement plan. This dissertation will contribute toward such research.

### **Cognitive Biases and Nudges in Retirement Outcomes**

In lieu of or in addition to efforts toward financially educating individuals, Thaler and Sunstein (2008) argue that a "nudge" in the right direction is an effective means of eliciting good financial decision-making, which is based in a relatively new field of inquiry dubbed behavioral economics. The best outcomes may be observed with multiple nudges in a certain direction,

whereas autonomy is preserved for individuals who take the time and effort to operate contrarily to the nudge (Sunstein, 2015), although such actions may be to their detriment.

### **Default Options**

When it comes to DC retirement plans, until recently it was common for the default investment to be a low-risk money market account. Although this shielded plan sponsors from potential liability for market losses in the unpredictable event of a stock market crash,<sup>20</sup> the sad fact is that many employees never log in or visit the Human Resources department to change how their investment elections (Beshears et al., 2009). Thaler and Sunstein (2008) remark:

Most specialists consider a 100 percent allocation to a money market account to be much too conservative. . . . Firms chose this option not because they thought it was smart but because they were worried about getting sued if they defaulted employees into something more sensible (but riskier). . . . The Department of Labor has finally issued new guidelines that are quite sensible, so the legal impediment to choosing a good default fund should no longer exist. (p. 131)

In the long run (i.e., several decades), low-risk investments run the much larger risk of missing out on market gains including even the erosion of real purchasing power in the scenario of inflation outpacing returns, which has become the new normal due to the unprecedented and sustained low interest rates employed by the Federal Reserve since the Great Recession. To the inattentive and/or financially uneducated, a nudge into a money market account can be financially debilitating in retirement. Fortunately, offering target-date retirement funds, grouping

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<sup>20</sup> Albeit, money market funds can “break the buck” resulting in losses of principal, and some did in the Great Recession, but this was uncommon and losses did not usually exceed 10%, unlike the U.S. stock market which saw a decline of over 50% from its peak in October 2007 to its low point in March 2009.

funds by asset class, and offering star rankings can nudge participants with low investor knowledge in the right direction (Morrin, Broniarczyk, & Inman, 2012), in addition to changing the default investment if no selection is made. In the case of the FRS DC plan, investments are contributed by default into an age-appropriate target-date retirement fund that reduces one's proportion of equity exposure as old age approaches, which is preferable to what many 401(k) participants in the private sector choose on their own (Mottola & Utkus, 2009).

### **Investor Autonomy**

When plan members are left to select investments on their own, if they take the effort to make any decision at all, they are likely to use naïve heuristics and cognitive biases such as dividing contributions equally between available options (“1/n rule”; Benartzi & Thaler, 2007, p. 86), investing in their company's stock,<sup>21</sup> selecting investments with high management fees based on displayed historical returns (e.g., past one, three, five, and 10 years) even though these do not predict future returns (Stabile, 2002), or treating separate pools of money as different in value rather than as fungible and of equal worth.<sup>22</sup> They are apt to make overly conservative or risky investments without recognizing their mistakes, to contribute too little (e.g., only up to the employer's matching offer), and to sell in a panic when securities are down in value, while seeing fit to escalate contributions when the market is up, or even divesting from stock investments at a low point only to re-invest for fear of continuing to miss out on gains at a high point (Benartzi & Thaler, 2002, 2007; Mottola & Utkus, 2009). Richards (2012) calls this the

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<sup>21</sup> Note that this is not a concern for teachers and other public workers.

<sup>22</sup> Note that there are situations where different pots of money should be treated as non-fungible and of differing worth, but these are mostly tax related, such as tax deferred versus tax exempt retirement accounts (i.e., traditional vs. Roth plans), business versus personal expenses, and money saved versus additional money earned, with the latter typically being less valuable due to income and payroll taxes.



“behavior gap,” which results in many investors only earning about half the returns they would have earned by merely buying and holding a mutual fund that tracks a broad market index such as the S&P 500 or Russell 3000 (Bogle, 2009; Thrupp, 2018). DB pension funds take many of these risks off the table and tend to be managed better than individuals manage their investments (although the bar is set quite low), as well as benefiting from pooling of risk (Millard, 2017).

**DB plans remove autonomy, which may be beneficial.** With respect to DB plans, the investment decisions are left to the pension fund managers, rather than individual participants. Participants are promised a monthly benefit in retirement connected with their worker class, years of service, and salary, without having to understand or manage investments. In fact, the employer (e.g., government) is required to pay out benefits as promised even in the event of a stock market crash, and it is incumbent on the employer to find the money if the markets are performing poorly.<sup>23</sup> Therefore, nudges are, at least with respect to investment decisions, irrelevant, and this may increase retirement wealth as compared with DC plans for a majority teachers (Rhee & Joyner, 2019). However, financial and plan-specific knowledge is still required in order to understand and optimize one’s pension benefit toward the incentives and disincentives inherent in the plan’s structure or idiosyncratic policies (Chalmers et al., 2014; Chan & Stevens, 2008), which can vary widely between plans.

As in the FRS, where participants must choose between a DB or DC plan within the first eight months of employment, a rather onerous and complex benefit-analysis is required for optimal decision-making. This requires the participant to predict future location, employment,

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<sup>23</sup> Although private-sector pension benefits may be eroded if the plan goes bankrupt and must avail of the Pension Benefit Guaranty Corporation government insurance agency due to caps the agency places on pension benefits, this is uncommon in the public sector (Detroit and Puerto Rico are notable exceptions).

and career decisions. The nudge, in this case, has recently been switched—beginning January 1, 2018, new participants are assigned by default to the DC plan, whereas the DB plan had always been the default in past years (Florida Division of Retirement, 2018).

**“Save More Tomorrow” nudge.** Regarding contributing too little toward retirement accounts, a recommendation from nudge theory is the “Save More Tomorrow” nudge (Thaler & Benartzi, 2004), which involves automatically increasing one’s retirement contributions on a periodic basis (e.g., annual), or when a salary increase is received. This results in the money being scarcely noticed or “missed,” so to speak. Although employers have begun to follow such schedules with 401(k) plans (Thaler, 2016), FRS contributions are fixed and cannot be changed, so Florida teachers must use other mechanisms such as a 403(b) plan or IRA to increase retirement funding. Given the unlikelihood of teachers to make an active choice regarding their retirement planning (Clark et al., 2016), it is unlikely that Florida preservice teachers will go out of their way to designate additional monies to an alternative DC account beyond what is mandatorily deducted for their FRS plans and Social Security (albeit, many do switch from the default DB plan to the DC plan; Ali & Frank, 2019; Chingos & West, 2015). Therefore, preservice teachers’ understanding of the FRS program and awareness of anticipated financial challenges in retirement is important toward their future financial wellbeing.

### **Conclusion**

Like numerous other financial concepts, the layperson has a poor understanding of their retirement plan, be it a DB or DC plan, despite the fact that this lack of knowledge results in profoundly deleterious financial consequences (Chalmers et al., 2014; Chan & Stevens, 2008; Fitzpatrick, 2015). Teachers are no exception (McKenzie, 1971). Although the past generation of career teachers were bestowed with idyllic pension plans, since the Great Recession, state

governments and school districts have been quashing this generosity with startling ferocity (Aldeman & Rotherham, 2014; Backes et al., 2016; Chingos & West, 2015; MyFRS, 2011; Snell, 2012), eliciting reasonable concerns about counterparty risk (Ettema, 2011). At the same time, worker mobility has increased (Goldhaber et al., 2017; Hess, 2009; Moeller et al., 2016), U.S. teacher pay is falling behind other college-educated occupations (Allegretto & Mishel, 2016), and education majors, like other college students and emerging adults, are bearing higher costs and greater debts (Hanna et al., 2012; Lusardi et al., 2016; Montalto et al., 2019; Scott-Clayton, 2018; West & Mottola, 2016). Given this zeitgeist of languishing financial wellness (Joo, 2008), it is surprising that research on in-service teacher retirement knowledge and preferences has only emerged recently (Ettema, 2011), and preservice teacher research is scarcer still (Lucey & Norton, 2011). Teachers often enter the career out of altruistic motivations (Serow, 1993), but as compensation and retirement benefits decline (Yu, 2011), heavy workloads and lack of administrative support can easily lead one to quit (Hong, 2012; Liston et al., 2006). And, although many educators prefer DC plans (Ali & Frank, 2019; Chingos & West, 2015), this may not be in their best interests (Benartzi & Thaler, 2002; Rhee & Joyner, 2019). In this climate, efforts to understand preservice teachers' knowledge and preferences regarding personal finance and retirement, particularly in a state like Florida where they will be faced with a DB versus DC choice, is a critical first step that my dissertation takes toward addressing these issues.

## CHAPTER THREE: METHODOLOGY

This study used survey methods to assess knowledge, perceptions, and challenges pertaining to personal finance, investing, and retirement among preservice teachers at the University of Central Florida, along with collection of responses using Amazon Mechanical Turk (MTurk) for purposes of comparison. This chapter covers the research design, sampling frames, how data was collected and analyzed, and how the survey instrument was developed, refined, and implemented in paper and Web modalities.

### Research Design

The research design for my study was non-experimental. Results from preservice teachers were analyzed descriptively and compared to the MTurk sample with inferential tests to address Research Questions 1–3. Multiple linear and logistic regressions pertaining to preservice teachers' anticipated career lengths and investing behavior were used in Research Questions 4–5.

### Populations

**Preservice teachers.** As of Fall 2018, UCF's College of Community Innovation and Education had 5,838 enrolled undergraduates (UCF, 2019c), of which 1,994 were enrolled or pending enrollment in bachelor's programs in education that lead to a teaching credential.<sup>24</sup> These students represented my population of interest, which was Florida preservice teachers. The most popular programs were the Elementary Education B.S. ( $n = 1,168$ ; 58.6%), Secondary Education B.S. ( $n = 252$ , 12.6%), and Early Childhood Development and Education B.S.

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<sup>24</sup> This total excluded 151 education majors in programs or tracks that do *not* require earning a teaching credential. Of these, 120 were in the Early Childhood Development track of the Early Childhood Development & Education B.S., 29 were in the Technical Education and Industry Training B.S., and two were in the Lifelong Learning track of the Exceptional Student Education B.S.

( $n = 236$ , 11.8%), with these three majors comprising 1,656 (83.0%) of preservice teachers (UCF, 2019c). This indicates that at least 70% of UCF preservice teachers intend to teach at the elementary level or younger.

I solicited additional demographic data from the college's Accreditation and Program Approval Specialist (O. Smith, personal communication, October 24, 2019). The data showed that as of Fall 2018, of 1,994 preservice teachers at UCF, 4.4% were freshmen, 10.3% sophomores, 36.5% juniors, and 48.8% seniors. The large proportion of upper-level students is not surprising given that approximately 80% are transfer students from two-year colleges. Gender data for 1,999 preservice teachers enrolled as of October 4, 2019 indicated that there were 1,732 females (86.6%) and 267 males (13.4%). Ethnicity data from October 4, 2019 was only available combined with 419 graduate students. Among these 2,418 students, 57.0% were White and non-Hispanic whereas 24.3% were Hispanic/Latino, 10.4% were African American, 7.5% were multi-racial or other races, and 0.8% did not report. No age data was available.

**MTurk.** My population of interest was individuals in the United States, ages 18–25, who are college students or graduates. I used the MTurk platform to access a subset of this population. Participants on this platform perform tasks for pay, such as transcribing text and completing academic surveys. They refer to themselves as “Turkers.” The rationale for my screening criteria was based on comparison of these participants' survey responses to the preservice teacher sample. Many of the survey items are U.S.-specific (for example, 401[k] plans), so it would not be appropriate to generalize the survey to other countries. Restricting to ages 18–25 captures a broad swath of college students (81% of my preservice teacher sample fell within this range), and excluding individuals who did not continue beyond high school improves comparability with respect to educational attainment.

***Anticipated population size.*** Limiting MTurk participants to Floridians was not feasible due to small population size. An analysis by Stewart et al. (2015) suggested that the average population sampled by a research laboratory using MTurk is only 7,300 of 16,000 active Turkers. Because I limited the survey to U.S. participants, this eliminated 25% of Turkers who work from other countries; also, only about 18% of U.S. workers are between ages 18–25 (Difallah et al., 2017), leaving a population of around 1,000. Additional restrictions on acceptance rate (98% or higher) and completed tasks (501 or more) reduced my population by approximately another 30% (Peer, Vosgerau, & Acquisti, 2014), to about 700. Based on U.S. population by state, if I had limited to Floridians, the population would only be approximately 45, which is insufficient. Although it is likely the MTurk population has increased since Stewart et al.'s (2015) analysis, it still does not accommodate such granularity.

***Background on motivation and demographics.*** American Turkers typically use the platform for supplemental income or entertainment and educational purposes, with 65% being female according to Ipeirotis (2018), which is comparable to UCF's College of Education and Human Performance<sup>25</sup> as of Fall 2015, which was 73.3% female (UCF, 2016), and MTurk has previously been used for research here (Peker, 2016). A demographic study by Difallah, Filatova, and Ipeirotis (2017) showed that Turkers tend to be younger than the U.S. population, which served to increase my population size as I filtered for participants ages 18–25.

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<sup>25</sup> Effective July 2018, the college was reorganized and renamed the College of Community Innovation and Education. Note that my MTurk sample was only 37.6% female, contrary to Ipeirotis (2018).

## Samples

**Preservice teachers.** I surveyed UCF preservice teachers primarily using face-to-face, in-person classroom visits arranged with instructors of teacher education courses by email. I located these courses via the UCF Course Search tool. By using paper surveys in an in-person setting during class time, a high response rate was achieved which exceeded 85% of in-class students. Although the Qualtrics survey platform (Appendix B) was also used in two courses using invitation announcements (Appendix C) and by eight face-to-face participants who elected to complete the survey on their mobile device, Qualtrics responses only accounted for 13.7% ( $n = 43$ ) of the sample with the vast majority being on paper. I obtained responses from 15.7% ( $N = 314$ ) of UCF's 1,994 preservice teachers (UCF, 2019c).

***Evaluation of status as preservice teachers.*** Because courses may include a mix of preservice teachers and other students, such as those taking a course as an elective, I considered a participant to be a preservice teacher if they selected “Yes” ( $n = 290$ ) or “Maybe” ( $n = 24$ ) to “Do you plan to become a teacher?” Participants who answered “No” ( $n = 13$ ) or “I am already a teacher” ( $n = 1$ ) were excluded, which reduced my sample size from 328 to 314.

**MTurk.** I solicited 205 responses using filters that limited participation to U.S. residents who have an acceptance rate of greater than 98% for other completed human intelligence tasks on the MTurk platform, and more than 500 completed tasks. These filters improve data quality by reducing automated or otherwise dubious responses (Peer et al., 2014). I used additional screening questions to enforce my other sampling delimitations (i.e., college students and graduates ages 18–25).

**Sample size.** A power analysis using G\*Power, Version 3.1.9.4 for the multiple linear regression analysis performed under Research Question 4 (predicting anticipated teaching career

length with five predictors) suggested that at an alpha of .05 and a power ( $1 - \beta$ ) of .80, a sample size of 189 is required in order to have an 80% chance of detecting a small to medium effect of .07 ( $f^2$ ). For chi-square tests used in Research Question 3 to compare preservice teachers and MTurk participants on dichotomous variables such as a good versus bad portfolio allocation, G\*Power suggests a total sample size of 197 in order to detect a small to medium effect size ( $w = .20$ ) at an alpha of .05 with 80% power. This suggests the sample sizes of 314 preservice teachers and 205 MTurk participants may be sufficient to detect small to medium effect sizes with statistical significance. Although G\*Power can compute a suggested sample size for a multiple logistic regression model, such as the one created under Research Question 5 of this dissertation, this was not pursued because it requires difficult speculations about the distributions of predictor variables and the correlations between them, in addition to other decisions regarding the dependent variable and modeling procedure (Faul, Erdfelder, Buchner, & Lang, 2009).

### **Data Collection Procedures**

The survey instrument (Appendix A) was solicited to preservice teachers at UCF, and as a comparison group, to paid survey participants ages 18–25 throughout the United States via MTurk (<https://www.mturk.com>). UCF students represent a broad and diverse set of backgrounds (UCF, 2016, 2019a, 2019b, 2019c). They are likely to go on to teach in Florida in a public or charter school that participates in the FRS, which is unique for giving workers a choice between a DB and a DC retirement plan. This necessitates understanding on the part of workers to make the best choice. The survey was administered both on paper and online, via Qualtrics (<https://www.qualtrics.com>).

**Preservice teachers.** I identified instructors of teacher education courses using the university's course search tool and emailed them asking to visit their face-to-face meetings to



administer the survey (Appendix A). I collected responses from preservice teachers during the Summer and Fall 2019 semesters, from June 18, 2019 to September 12, 2019. In total I visited 15 classes taught by eight instructors, who allowed 15 minutes of class time, typically at the beginning of class, for their students to complete the survey. This was voluntary and anonymous, with no compensation offered except by one instructor who gave two extra credit points to all students in her class. I also surveyed students in my fully online course, EME 2040: Introduction to Technology for Educators, using Qualtrics. They received 10 extra credit points (1.33% of course grade) for completing the survey, but could complete an alternate assignment if they wished. This was voluntary and confidential, but not anonymous, because I collected randomly-generated verification codes to verify submissions and award extra credit.

In face-to-face classrooms, I distributed a pen and a paper copy of the survey, but included a URL at the top (<https://tinyurl.com/ucfptrs>)<sup>26</sup> to access the survey via Qualtrics if they elect to do so (“bring your own device” or “BYOD” using their mobile device). Only eight students elected to use Qualtrics, plus two others who were solicited online (Appendix C) by an instructor who could not spare the time for an in-class visit, and 31 completed the survey online for extra credit in my fully-online course. Lucey and Norton’s (2011) response rate for a similar survey solicited by email was only 4.7%, but mine was much higher. Although I did not keep close track of attendance to compare with the number of submitted surveys in face-to-face visits, I estimate that it exceeded 85%, excluding students who had already taken the survey in prior

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<sup>26</sup> The abbreviation shown in the TinyURL (<https://tinyurl.com>) redirection hyperlink, UCFPTRS, stands for University of Central Florida Preservice Teacher Retirement Survey. The TinyURL redirected to the full Qualtrics URL ([https://ucf.qualtrics.com/jfe/form/SV\\_efdXppkVowwvI2h](https://ucf.qualtrics.com/jfe/form/SV_efdXppkVowwvI2h)), which is difficult to type.

classroom visits (I asked them to refrain from re-taking it). More information is included in Chapter 4 regarding specific courses visited, modalities, and demographics.

**MTurk.** I collected responses to a modified version of the survey on Qualtrics using MTurk, from July 12, 2019 to August 3, 2019, among U.S. residents ages 18–25 without limitations on career or state of residence. The modified survey removed several demographic and FRS-specific items because participants may not be college students and were unlikely to know about the FRS. In the headline, description, and Informed Consent section, participants were informed that they must be between ages 18–25 and a college graduate or current college student in order to complete the survey; these delimitations were included to improve comparability with the preservice teacher sample. This was also enforced via screening questions at the beginning of the survey.

Using Amazon’s screening functions, the survey was shown only to U.S. residents, and to ensure quality of data, was limited to Turkers with 501 or more previously approved tasks<sup>27</sup> and an approval rate of 98% or higher (Buhrmester et al., 2018; Peer et al., 2014). The MTurk sample facilitated comparisons with the preservice teacher sample on several items. Each participant was paid \$1.00, which is within the recommended range for a survey of this length according to a wiki page created by Turkers (We Are Dynamo Wiki, 2017). This level of compensation exceeds Buhrmester et al.’s (2011), who paid as little as 10¢ for a 10-minute survey and found only a decline in response rates but no difference in data quality based on compensation levels.

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<sup>27</sup> I began with a threshold of 1,001 or more previously approved tasks ( $n = 111$ ), but data collection slowed so on July 30, 2019, I began targeting those with 501–1,000 previously approved tasks, from which I collected 94 responses in five days.

A total of 205 participants completed the survey. Participants came from throughout the United States with only 14 (6.8%) having I.P. addresses located in Florida. In anticipation of this, questions pertaining specifically to Florida were either removed, or in one instance, prefaced with “Imagine you are about to become a teacher in Florida.” Limiting the survey to Florida residents was infeasible due to MTurk’s population size (Stewart et al., 2015). I have included screenshots and additional details about differences between the surveys in Appendix B.

*Re-posting and preventing duplicates.* I posted and re-posted the task with a sample size of nine each time to avoid paying an additional 20% fee (Amazon Mechanical Turk, 2019), which would have increased Amazon’s fee from 20¢ to 40¢ and my total cost from \$1.20 to \$1.40 per response. This also moved the task to the top of the list and allowed a change in screening criteria during data collection due to exhausting the pool of potential participants (I reduced a requirement for more than 1,000 completed tasks to 501–1,000). However, additional measures to prevent duplicate responses were required. As recommended by Buhrmester (2018), I included a message in the survey instructions saying: “This HIT [human intelligence task] has been re-posted. Only one completion per person will be compensated.” I received 10 duplicate responses which I disqualified and excluded using Amazon Worker ID numbers. Amazon limits workers to one account by collecting and verifying Social Security Numbers, which further helped to prevent duplicates. In Figure 2, I have included a screenshot of the survey solicitation and instructions as seen by participants on the MTurk platform. This is what the solicitation looked like at the mid-way point in data collection through the end. By this point I had added the criteria to the title and the warning messages in multiple places in bold and/or red text to help prevent duplicate responses or confusion among Turkers.

A Survey of Investing and Retirement Knowledge and Preferences \*\* Re-posted \*\* College students/graduates ages 18 to 25 ONLY \*\*

Requester: Richard Thripp      Reward: \$1.00 per task      Tasks available: 0      Duration: 6 Hours

Qualifications Required: HIT Approval Rate (%) for all Requesters' HITs greater than 98 , Location is US , Number of HITs Approved less than or equal to 1000 , Number of HITs Approved greater than 500

**Survey Link Instructions** (Click to collapse)

This is an approximately 10-minute survey on knowledge and perceptions of retirement and financial challenges, **open only to U.S.-based participants between the ages of 18 and 25 who are current college students or college graduates**. Select the link below to complete the survey. At the end of the survey, you will receive a code to paste into the box below to receive credit for taking this survey. **This HIT has been re-posted. Only one completion per person will be compensated.**

**Make sure to leave this window open as you complete the survey.** When you are finished, you will return to this page to paste the code into the box.

Survey link: [https://ucf.qualtrics.com/jfe/form/SV\\_6zIUyHmobzqexMh](https://ucf.qualtrics.com/jfe/form/SV_6zIUyHmobzqexMh)

*Note: This survey is open only to U.S.-based participants between the ages of 18 and 25 who are current college students or college graduates. **This survey has been re-posted; please do not re-take it if you have taken it already.***

On the last page before submitting your survey, you will be provided a survey completion code. Please copy and paste it here.

e.g. 123456

Figure 2. MTurk survey solicitation and instructions.

**Consolidation and analysis of collected data.** I consolidated all preservice and MTurk data into a single file using IBM’s Statistical Package for Social Sciences (SPSS) software, Version 23, and used SPSS for all descriptive statistics and inferential tests. I used the Split File function with a sample variable (preservice teacher or MTurk participant), along with the Select Cases function to restrict the preservice teacher sample to ages 18–25 for analyses comparing the two samples for Research Question 3. I scanned 271 paper surveys into PDF files and manually entered collected data into the SPSS file from the scanned copies. I configured Qualtrics to code exported data to match the variable names and values I had established in the SPSS file in order

to facilitate integration of the data. Composite variables were constructed in SPSS or Microsoft Excel. I was cautious when manipulating data to avoid errors and I double-checked that data was associated with the correct participants.

### **Support for Use of MTurk**

MTurk samples have been shown to have scores as valid as a comparison group (Azzam & Jacobson, 2013), which was important to my goal of seeing how preservice teachers compare to others in their education and age range. Although Rouse's (2015) experience with MTurk presented reliability issues leading him to suggest the use of attention-check items, Buhrmester, Talaifar, and Gosling (2018) purport that using MTurk screening criteria is preferable, which I implemented by limiting to participants with over 500 approved tasks and at least a 98% approval rate. This was also consistent with Peer et al.'s (2014) recommendations.

Among Turkers, the most resounding complaint about academic research is underestimation of time required to complete an activity (Lovett, Bajaba, Lovett, & Simmering, 2018; We Are Dynamo Wiki, 2017). This can even reduce data quality because participants are paid not based on the actual time worked, but a fixed payment known in advance (in my survey's case, \$1.00). Turkers may rush through a survey that misleadingly reported a brief estimated completion time to avoid losing time and money by taking the actual time needed to complete the survey. My MTurk survey was briefer than my preservice teacher survey because it omitted two demographic questions and five items relating to the FRS, and actual completion times from Qualtrics showed that 75% of my MTurk participants ( $n = 154$ ) finished in under 10 minutes.

Regarding data reliability in general, Buhrmester et al. (2011) found that MTurk data is of equal or greater reliability than traditionally collected data. Additionally, they reported that Turkers are more demographically diverse than Web or undergraduate samples. This is

consistent with other research that finds MTurk samples are both valid and representative (e.g., Casler et al., 2013). Finally, the use of MTurk as a viable comparison group for survey research also has empirical support (Azzam & Jacobson, 2013).

### **Instrumentation**

The retirement preferences of pre- and in-service teachers has not been studied at length, and retirement knowledge has also seen little attention, both among preservice teachers (notable exceptions include Ettema, 2011; Lucey & Norton, 2011), and in-service teachers (e.g., DeArmond & Goldhaber, 2010). Not surprisingly, instruments or scales that produce valid and reliable scores regarding retirement knowledge and preferences are missing from the extant literature, particularly regarding pension plans (Ettema, 2011; Lucey & Norton, 2011; Smith, 2012). Therefore, I wrote new questions to address most of the goals of this research.

I developed the instrument (Appendix A) with input at each step from my dissertation chair and committee members, which included a professor with expertise in survey research and the Research Director of the Financial Industry Regulatory Authority's (FINRA) Investor Education Foundation. A professor of economics also provided feedback on the items. I implemented nearly all of these experts' recommendations (Table 6). The instrument had 39 items covering whether participants plan to become teachers, intended career length and retirement age, financial knowledge quiz items, familiarity and perceptions, demographics, and more. Ten items were borrowed from other researchers (i.e., Q21 from Peng et al., 2007; Q22–Q24 from Lusardi & Mitchell, 2008; and Q26–Q31 from Lucey & Norton, 2011). A novel investing exercise I created using FRS DC fund choices yielded additional insights.

Table 6

*Implemented Recommendations From Dissertation Committee and Others Regarding Survey*

<b>Recommendation</b>	<b>Rationale</b>
Clarify “retire” (e.g., “from teaching”)	I clarified the anticipated retirement age question as “from teaching” and for Qualtrics added skip logic if they will not become a teacher
Consolidate 401(k), 403(b), and 457 plans in familiarity question	Consolidated into one sub-item to avoid data noise, because most individuals are not familiar with 403(b) or 457 plans
Clarify wording on DB vs. DC preference item	I added the terms “defined-contribution” and “defined-benefit,” and explained that the DB plan requires no investment decisions
Remove DB vs. DC classification question	This item asked participants to classify various types of retirement plans as DB or DC, and was thought to be too difficult and likely that most students would answer incorrectly or select “don’t know”
Skip Florida-related items for MTurk	Turkers must be given a time estimate; most participants will not be in Florida so I removed such items and lowered to 10 minutes
Reduce portfolio exercise to five choices	Including all 22 FRS DC investment options (MyFRS, 2019b) would be overwhelming; I reduced to five key options
Remove the phrase “healthy retirement” in two Lucey and Norton (2011) items	This would confuse participants on the definition of this term, or whether it pertains to their health rather than finances; I replaced “funding a healthy retirement” with “funding my retirement” in the two pertinent items
Add “I do not currently have this type of debt” for types of debt	Not all participants will have various types of debt (mortgage, auto loan, credit card, etc.); this option avoids data noise
Ask age as a number rather than categories	Then it can be treated as continuous and Mottola at the FINRA foundation had found participants are not offended
Add privacy statement to invitation message	Added this sentence: “Your responses will not be shared with anyone, and only aggregate results will be reported” (Appendix C)

The survey included four knowledge questions on personal finance and investing, including the widely used “Big Three” items by Lusardi and Mitchell (2008, 2011a). A fourth item, “over the last 30 years in the United States, the best average returns have been generated by [stocks, bonds, certificates of deposit, precious metals, money market accounts, or don’t know],” was obtained from a 2003 National Association of Securities Dealers instrument (predecessor to FINRA; as cited and used by Peng et al., 2007); however, the original version read “20 years” but I changed it to 30 because I wanted it to be clear that stocks were the best investment, without participants having to consider whether stocks did worse in the past 20 years due to inclusion of both the 2000 bursting of the dot-com bubble and the Great Recession.<sup>28</sup> Beyond this, the survey included a portfolio allocation exercise that I designed, with five funds selected from the 22 choices (MyFRS, 2019b) available to FRS investment plan members, where participants are asked to direct their retirement contributions and sum to 100%.

I also included an item asking about level of concern with six types of debt on five-point Likert scales, and another subscale consisting of six items on financial challenges one expects to face in retirement (Lucey & Norton, 2011), with permission from the original authors (Appendix D). On two items, I changed “funding a healthy retirement” to “funding my retirement”; this was suggested by two statisticians and two subject-matter experts to avoid confusing participants. These items addressed Research Question 2. The six items I used from Lucey and Norton’s (2011) *Survey of Students’ Retirement Understandings and Expectations* are listed below, and use a five-point Likert scale ranging from strongly disagree to strongly agree:

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<sup>28</sup> Note also that the S&P 500 produced zero real returns from 1966 to 1982, so it may be possible for stocks to perform poorly over a 20-year period but is less likely for a 30-year period (Carlson, 2014).



1. I expect that I will have to work during retirement,
2. Student loan repayments will prevent me from funding my retirement,
3. Credit cards repayments will prevent me from funding my retirement,
4. I want to save for retirement, but don't think my salary will be enough to afford it,
5. I want to save for retirement, but don't think I can afford to invest beyond what I will contribute to employer's retirement plan, and
6. I do not need to save as much for retirement because my spouse will save enough for both of us.

**Three versions of instrument.** Appendix A shows the paper version of the instrument for preservice teachers, and Appendix B details differences between the three versions: paper preservice instrument, Qualtrics preservice instrument, and MTurk instrument (Qualtrics). The paper version followed several best practices for translating a digital survey to paper (Dillman, Smyth, & Christian, 2014), such as using white space and emphasis appropriately, and using text to direct the participant through the survey (“start here,” “please continue on the next page,” “continue here”). The goal for the two preservice instruments was for them to be interchangeable, but there were distinct differences due to the characteristics of each modality that could not be avoided, such as the lack of validation on the portfolio allocation exercise in the paper survey. The MTurk instrument removed several Florida-specific items because most participants were from other states, among other changes. Differences between versions of the survey are discussed further in Appendix B. Data collection procedures and all instruments were approved by the UCF Institutional Review Board (Appendix C), with the MTurk data occurring under a separate submission.

**Exploratory nature of instrument.** The majority of survey items, such as those relating to retirement plan preferences, were novel and evaluated for face and content validity by consulting with experts, but not for other forms of reliability or validity. Overall, these and other items were exploratory, such as the portfolio allocation exercise; preference and concern items about DB and DC retirement plans, vesting, and debts; and awareness items pertaining to various aspects of vesting, Social Security, and the FRS.

Regarding items borrowed from other researchers, use of the “Big Three” financial knowledge items (Lusardi & Mitchell, 2008, 2011a) is extensive in the literature and these items have shown internal-consistency reliability and criterion validity for scores from many populations and samples (e.g., Lusardi & Mitchell, 2011a, 2011b, 2014). In addition, Lucey and Norton (2011) found that their retirement challenges and expectations subscale had internal consistency ( $\alpha = .72$ ) for their sample of Illinois preservice teachers, although this dissertation is the first subsequent published use of the scale.

**Subscale reliability analyses.** Besides Lucey and Norton’s (2011) retirement challenges and expectations subscale that I have assessed for internal-consistency reliability with respect to the preservice and MTurk samples in Chapter 4, there were two new multi-part items in the survey amenable to such reliability analyses: the retirement plan familiarity item (Q5) and the debt concerns item (Q38). Reliability analyses for these items are described below.

***Retirement plan familiarity.*** This item (Q5; Appendix A) asked about familiarity with five types of retirement plans (employer-sponsored, FRS investment, FRS pension, IRA, and Social Security) on a five-point Likert scale. This scale had a Cronbach’s alpha of .858 for the sample of 312 preservice teachers who answered all five sub-items, indicating strong internal consistency. The mean composite score for all sub-items was 10.78, with a range of 5–25,

standard deviation of 4.74, and a median of 10. The lowest inter-item correlation was .416, between familiarity with Social Security and the FRS investment plan. Removal of the two FRS-specific items, which were omitted from the MTurk survey, resulted in a Cronbach's alpha of .838 for preservice teachers ( $N = 314$ ) and .798 for MTurk participants ( $n = 204$ ) among only the employer-sponsored, IRA, and Social Security familiarity sub-items. This suggests that familiarity with different types of retirement plans was strongly related.

***Debt concerns.*** This item (Q38; Appendix A) asked about concern with six types of debt on a five-point Likert scale: auto loans, credit cards, loans from family, mortgage, student loans, and other debt. A sixth option, "I do not currently have this type of debt," was coded as 0 so that the range for each item was ordinal with this being the lowest item and "extremely concerned" (5) being the highest. I conducted a reliability analysis for the preservice teachers ( $n = 277$ ;  $\alpha = .772$ ) and MTurk participants ( $n = 204$ ;  $\alpha = .758$ ) who answered all six items, which showed evidence of internal consistency for both samples. The lowest inter-item correlation was between mortgage and student loans for both samples (preservice: .205; MTurk: .047). If totaling the six items to create a composite variable (range = 0–30), the mean concern scores were 10.45 for preservice teachers ( $SD = 5.88$ ) and 13.86 for MTurk participants ( $SD = 6.48$ ).

### **Data Analysis Procedures**

Collected survey data was analyzed using descriptive statistics and inferential procedures including linear and logistic regressions, Mann–Whitney  $U$  tests, and chi-square tests, whereas qualitative data is not analyzed in this dissertation. The samples were delimited differently for certain analyses to exclude participants with missing data or restrict to certain age ranges, and several composite variables and dichotomous or dummy-coded variables were constructed to aid analyses. Dichotomous portfolio classification rules were also devised for the investing

allocation exercise. Herein, these procedures are detailed, organized around this study's five research questions.

### **Research Question 1: Preservice Teacher Knowledge**

This research question was evaluated using frequencies and percentages only. The items evaluated included dichotomous and five-point Likert items, as well as financial knowledge multiple-choice quiz items for which I report the percentage of correct answers, incorrect answers, and "don't know" responses among the full preservice teacher sample.

### **Research Question 2: Anticipated Retirement Challenges**

This research question was evaluated using frequencies and percentages only, based on six items borrowed from Lucey and Norton's (2011) survey. Participants selected from choices ranging from "strongly disagree" to "strongly agree" on a five-point Likert scale. Proportions of responses are provided for each question and choice among the full preservice teacher sample and MTurk sample, as well as compared descriptively for several collapsed agree and disagree options in Chapter 5. I also performed an internal-consistency reliability analysis for this set of items, separately for each sample, using Cronbach's alpha.

### **Research Question 3: How Do Preservice Teachers Measure Up?**

This research question involved comparing the MTurk sample of U.S. college students/graduates ages 18–25 to the preservice teacher sample. To improve comparability, the preservice teacher was delimited to those who were ages 18–25 ( $n = 253$ ; 80.6%) in analyses contained under this research question. In several instances, further delimitations were made regarding missing data, which are described herein.

**Financial knowledge.** For four multiple-choice financial knowledge quiz items on the survey that each had a correct answer, I constructed a composite score with each correct answer

being worth one point and incorrect or “don’t know” answers being worth zero points. One preservice teacher who skipped two items was excluded, whereas two preservice teachers who skipped one item were included ( $n = 252$ ) with the skipped item contributing zero to their composite scores. All other preservice teachers and 205 MTurk participants answered all four items. A Mann–Whitney  $U$  test was then used to compare composite scores between samples.

**Retirement knowledge.** Both samples were asked how familiar they are with three types of retirement plans on a five-point Likert scale ranging from “not at all familiar” to “extremely familiar.” I reported frequencies and percentages for each sample, item, and choice. I constructed a composite score (range = 3–15) for familiarity with a value of 1–5 for each question based on participants’ responses. One MTurk participant who skipped one item was excluded ( $n = 204$ ), whereas all other MTurk participants and all 253 preservice teachers responded to all items. A Mann–Whitney  $U$  test was then used to compare composite scores between samples.

**Possession of accounts.** Participants were asked to report their possession of a bank account, as well as three types of investing/retirement accounts. For this variable, the sample was further delimited to remove 15 preservice teachers ages 18–25 (new  $n = 238$ ) and eight MTurk participants (new  $n = 197$ ) who selected “Prefer not to say” or no choices for this item.<sup>29</sup> I reported the percentage of each sample that possessed each type of account, as well as a dichotomous composite variable for possessing at least one of the following: brokerage account, 401(k) or other employer-sponsored retirement account, or IRA. A chi-square test of independence was then used to test for differences on this variable between samples.

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<sup>29</sup> This was a multiple selection item with checkboxes, which makes it difficult to determine whether *not* checking any boxes means a participant had none of the listed accounts, or merely skipped the question. Because having a bank account was nearly ubiquitous, I treated having checked no boxes as missing data.

**Investing knowledge.** This item requires a lengthy explanation, presented herein. This section is also applicable to Research Question 5 and should be referred back to when reading relevant sections of Chapters 4–5. To assess investing knowledge (synonymous with “investing allocation sophistication” for my purposes), I created a portfolio allocation exercise (Figure 3). This item asked participants to pretend they are directing their investments into a DC retirement account from a menu of five real fund choices offered to FRS investment plan participants (MyFRS, 2019b). This was reproduced in the Qualtrics version (see Appendix B) using a dynamically calculated total box and validation criteria requiring the total to sum to 100%, whereas paper participants had to sum to 100% on their own.

Assume you are participating in the Florida Retirement System investment plan, a defined-contribution retirement account similar to a 401(k) plan. Three percent of your salary comes out of each paycheck and gets deposited in investment(s) of your choice from the following list. **Please indicate the percentage of contributions that you would contribute to each fund.** You can put 100% in one fund, or divide contributions between funds as you see fit.

**FRS Money Market Fund**

*Risk: Very low* \_\_\_\_\_ %

*Management fee: 0.06% per year*

The Fund seeks as high a level of current income as is consistent with liquidity and stability of principal.

**FRS U.S. Bond Enhanced Index Fund**

*Risk: Low* \_\_\_\_\_ %

*Management fee: 0.05% per year*

The Fund seeks to achieve or modestly exceed the total return of the Barclays Capital Aggregate Bond Index.

**FRS Retirement Fund (2060)**

*Risk: Aggressive* \_\_\_\_\_ %

*Management fee: 0.11% per year*

This fund favors stocks over bonds. It is best suited for FRS members who have between 45 and 50 years before reaching their FRS normal retirement age or before they retire and begin taking distributions.

**FRS U.S. Stock Market Index Fund**

*Risk: Aggressive* \_\_\_\_\_ %

*Management fee: 0.02% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of its Underlying Index. The Underlying Index is the Russell 3000 Index.

**FRS Foreign Stock Index Fund**

*Risk: Aggressive* \_\_\_\_\_ %

*Management fee: 0.03% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of the MSCI ACWI ex-U.S. IMI Index.

**Please double-check that your total sums to 100%.**

Figure 3. Portfolio allocation exercise from paper version of preservice teacher survey.

***Rationale for construction of exercise and explanation of 2060 target-date fund.***

Although there are 22 fund choices in the full FRS menu (MyFRS, 2019b), 11 are target-date

funds of which I only included the 2060 fund<sup>30</sup> because this target date would apply to the largest swath of participants (participants of ages 18–25 will be ages 59–66 in the year 2060).<sup>31</sup> The other four funds I included cover the major asset classes recommended for typical investors (Bogle, 2009; Richards, 2012): index funds of short-term money markets, domestic bonds,<sup>32</sup> domestic stocks, and foreign stocks. The exercise was limited to five funds to avoid overwhelming participants, and these funds alone are sufficient for various retirement portfolios and risk profiles (Mitchell et al., 2008). Older participants for which the 2060 target-date fund is not the target audience can mimic a target-date fund with the other four funds; target-date funds merely reduce risk by reducing equity exposure as one ages (see Figure 4 for the “glide path” of the FRS 2060 fund). Note that in the actual FRS, participants are, by default, placed in the investment plan with 100% allocated to a target-date fund matching their age (Florida Division of Retirement, 2018). However, they may change their investments at any time.

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<sup>30</sup> The text “between 45 and 50 years before reaching their FRS normal retirement age” should have read “about 40 years”; however, even recent FRS literature (MyFRS, 2019c) has not made this correction.

<sup>31</sup> If using only electronic surveys, a better method would be to first ask for participants’ ages and then dynamically include only the target-date fund relevant to their full retirement age. One could tailor this further by incorporating both their current ages and desired retirement ages (Q4 & Q33; Appendix A).

<sup>32</sup> Unfortunately, no index fund of foreign bonds is available in the FRS menu (such a fund would include debts of governments, such as Japan, and of corporations, such as UBS Group AG).



## Glide Path<sup>6</sup>

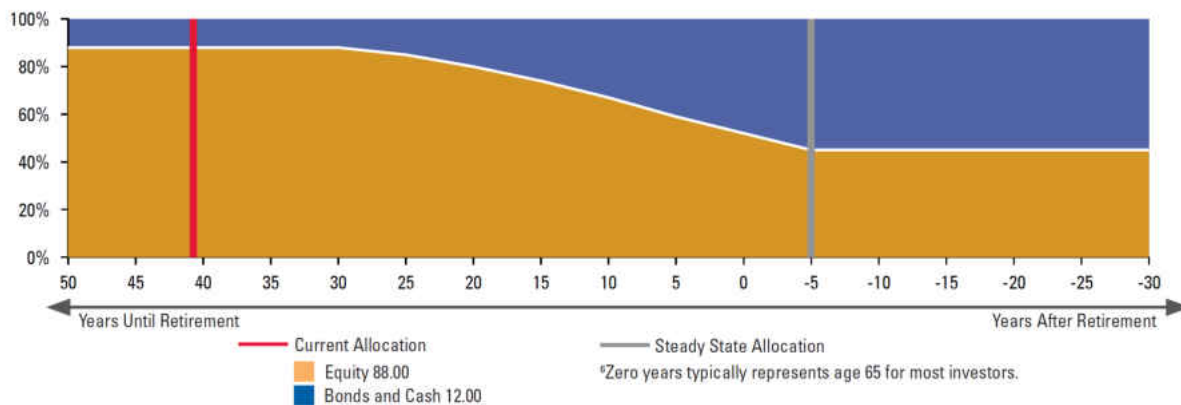


Figure 4. Investment glide path for FRS 2060 target-date retirement fund. From “FRS 2060 Retirement Fund Profile,” by MyFRS, 2019c (<https://www.myfrs.com/FundProfile.htm>). In the public domain.

**Missing data.** For this part of Research Question 3, the preservice teacher sample was further delimited to the 202 of 253 (79.8%) preservice teachers (ages 18–25) who provided valid responses, whereas the other 51 either skipped the item or provided unusable data (i.e., their contributions did not equal 100%; some entered numbers below 1% that were similar to expense ratios whereas others were in the 80–110% range). There was no missing data for MTurk participants because they could not advance in the Qualtrics version unless their math summed to 100%, whereas paper preservice participants had more freedom.

**Classification rules.** Subsequent to collection of data, I devised the following dichotomous classification rules to grade portfolios as “good” or “bad.” The main mistake participants made was avoiding investment risk, which will assuredly suppress portfolio growth over several decades (Bogle, 2009). Therefore, for participants Age 29 or younger, based on recommendations to be more heavily invested in stocks when one is younger (Mitchell et al., 2008), my rule was simply that a good portfolio must allocate less than 15% to the money market

fund and less than 30% to the money market and bond funds combined. This means that a “good” portfolio allocated at least 70% to equities-heavy funds, and consequently at least 61.6% to equities (due to the fact that the 2060 target-date fund is presently 88% equities and 12% bonds and cash; see Figure 4). I did not pay heed to how participants divided contributions between U.S. and foreign stocks nor the target-date fund as these decisions are hotly debated (Bogle, 2009; Richards, 2012) and are of lesser importance.

Although not applicable for Research Question 3 due to the fact that the preservice teacher sample was delimited to ages 18–25 to match the MTurk sample, for age appropriateness (Mitchell et al., 2008) I used a different classification rule for preservice teachers Age 30 and older. These participants were required to have less than 20% in the money market fund and less than 50% in the money market and bond funds combined in order to be classified as “good.”

*Analytic procedures.* I reported mean percentages contributed to each fund by each sample and frequencies and percentages for “good” versus “bad” portfolios. I then used a chi-square test of independence to test for differences on this variable between samples. I also created a variable for having made the  $1/n$  error (Benartzi & Thaler, 2001, 2007) for participants who put 20% in each of the five funds. I reported mean percentages contributed to each fund for a further-delimited sample with those who made the  $1/n$  error removed, and used a chi-square test of independence to test for differences between samples in proportions for the  $1/n$  error.

#### **Research Question 4: Career Length, Preferences, and Vesting Concerns**

For Research Question 4, I predicted anticipated teaching career length among preservice teachers using a multiple linear regression model incorporating the following predictors: a dichotomous item on DB–DC preference, a five-point Likert item on DB versus salary preference, and a five-point Likert item on level of concern about not meeting Florida’s eight-

year pension vesting requirement. I also reported descriptive statistics for each variable. Anticipated teaching career length was continuous, reported in years. I used dummy coding on the two Likert items to collapse “somewhat prefer” and “strongly prefer” regarding DB plans versus salary increase and shades of low and high concern about vesting; the middle option was the reference category for all four dummy-coded variables. The sample was delimited to include only the 250 of 314 preservice teachers with valid data on all variables. The main reason for exclusion was providing a range or other non-integer answer on the dependent variable ( $n = 50$ ).

### **Research Question 5: Investment Allocation Sophistication**

For Research Question 5, I predicted investment allocation sophistication among preservice teachers using the same classification rules described under Research Question 3, via a multiple logistic regression model incorporating the following seven predictors: financial knowledge, possession of accounts, DB–DC preference, age, gender, academic class standing, and minority status. Descriptive statistics for each variable are reported. The investment allocation exercise and dichotomous classification rules were explained in a prior sub-section of analytic procedures for Research Question 3. The sample was delimited to include only the 220 of 314 preservice teachers with valid data on all variables. Most excluded participants skipped the allocation exercise or provided numbers that did not sum to 100% ( $n = 71$ ); others ( $n = 23$ ) were excluded for missing data on one or more dependent variable(s).

The financial knowledge predictor used a composite score with each correct answer on four questions being worth one point, like in Research Question 3. Possession of accounts used a dichotomous composite variable for possession of one or more of four types of accounts: brokerage account, 401(k) or other employer-sponsored retirement account, FRS plan, or IRA. DB versus DC preference was already a dichotomous item (Q9; Appendix A). Age was

continuous, whereas gender was dichotomized (one third-gender participant was excluded). For parsimony and creation of groups that were not lop-sided, academic class standing was dichotomized as senior versus junior or below and minority status was dichotomized as White *and* non-Hispanic versus *not* White and/or Hispanic.

### **Conclusion**

The methods I have detailed facilitated evaluation of the research questions, which were developed in concert with the instrument (Appendix A) and in consultation with existing literature on pre- and in-service teachers' financial and retirement knowledge, preferences, and concerns. Overall, I sought to describe Florida preservice teachers' financial and retirement knowledge and anticipated retirement challenges (Research Questions 1–2); to compare preservice teachers' knowledge, investing sophistication, possession of accounts, and familiarity with retirement plans to an external source of primary data collected via Amazon Mechanical Turk (Research Question 3); and to predict preservice teachers' anticipated teaching career length and retirement investment allocation sophistication based on financial knowledge, retirement plan preferences, and several other variables (Research Questions 4–5).

## CHAPTER FOUR: RESULTS

In this chapter, I present the results of this research, including descriptive and inferential statistical analyses oriented toward five research questions. A detailed discussion of the implications of these findings will be presented in Chapter 5. The specific research questions this dissertation sought to address were as follows:

1. What is the extent of Florida preservice teachers' knowledge regarding personal finance and investing, the Florida Retirement system, and retirement plans in general?
2. To what extent do Florida preservice teachers anticipate facing financial challenges in funding their retirement and during retirement?
3. How do Florida preservice teachers compare to college students and graduates ages 18–25 on financial, retirement, and investing knowledge?
4. To what extent is anticipated teaching career length predicted by DB–DC preference, DB versus salary preference, and concern about meeting Florida's eight-year DB vesting period?
5. To what extent is the investment allocation sophistication of preservice teachers predicted by financial knowledge, possession of financial or retirement accounts, DB–DC preference, and demographic characteristics?

### Samples

#### Preservice Teachers

The preservice teacher sample consisted of 314 students at UCF, out of a population of 1,994 preservice teachers within the college (data as of Fall 2018; UCF, 2019c). Participants were deemed to be preservice teachers based on answering “yes” ( $n = 290$ ; 92.4%) or “maybe”

( $n = 24$ ; 7.6%) to “do you plan to become a teacher?” (Q1; Appendix A). Of the 310 who provided their gender, 87.7% were female (Table 7). Ages ranged from 18 to 50, with the median age being 22 and mean age being 23.51; 80.8% were 25 or under, and 89.8% were 30 or under. Of the 293 participants who provided their race, 80.9% were White (Table 8). Of the 301 participants who answered as to whether they were of Hispanic, Latino, or Spanish origin, 77 (26.5%) said yes, which is unusually high for teachers (Hodgkinson, 2002), and is consistent with UCF’s 27.5% Hispanic-student enrollment and designation by the U.S. Department of Education as a Hispanic-serving institution (UCF, 2019b). Of these 77 students, the most common indicated origins were Puerto Rico ( $n = 26$ ; 33.8%) and Cuba ( $n = 17$ ; 22.1%). Of 302 participants who provided data, 61.6% ( $n = 186$ ) were non-Hispanic Whites and 38.4% ( $n = 116$ ) were Hispanic and/or not White.<sup>33</sup>

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<sup>33</sup> Although I had data from only 293 participants regarding race and 301 regarding Hispanic origin, I could make determinations with respect to *not* being a non-Hispanic White for 302 participants based, in some instances, on responses to only one of two items. Note that I am aware that APA Style (American Psychological Association, 2010) directs us to use the word “Caucasian,” not “White,” when discussed alongside terms such as “Hispanic,” but I refrained from doing so for clarity due to having used “White” in my survey instrument to be consistent with U.S. Census racial designations.

Table 7

*Gender of Preservice Teachers*

<b>Gender</b>	<b><i>n</i></b>	<b>%</b>	<b><i>M age</i></b>	<b>% Minority</b>
Female	272	87.7	23.36	37.6
Male	35	11.3	24.17	45.7
Non-binary	3	1.0	*	*
<b>Overall</b>	<b>310</b>	<b>100.0</b>	<b>23.45</b>	<b>38.5</b>

*Notes:* This table excludes four participants who skipped the gender item ( $n = 1$ ) or selected “Prefer not to say” ( $n = 3$ ). “Minority” is Hispanic and/or not White; percentages are for participants who provided data ( $n = 301$ ). Data is masked where  $n < 5$ .

Table 8

*Race of Preservice Teachers*

<b>Race</b>	<b><i>n</i></b>	<b>%</b>	<b><i>M age</i></b>	<b>% Male</b>	<b>% Hispanic</b>
White	237	80.9	23.24	10.6	21.2
African American	34	11.6	23.62	14.7	24.2
Asian or Pacific Islander	8	2.7	20.00	25.0	0
Other	14	4.8	24.43	7.1	64.3
<b>Overall</b>	<b>293</b>	<b>100.0</b>	<b>23.25</b>	<b>11.3</b>	<b>23.1</b>

*Notes:* This table excludes 21 participants who skipped the race item ( $n = 13$ ) or selected “Prefer not to say” ( $n = 8$ ). Those who selected two or more races ( $n = 12$ ) were generally coded under a non-White race (e.g., five participants who selected White *and* Black or African American were coded as the latter). Hispanic percentages are for participants who provided data ( $n = 290$ ).

Among the 308 students who provided their academic class standing, the vast majority were juniors ( $n = 156$ ; 50.6%) and seniors ( $n = 121$ ; 39.3%), whereas only six were freshmen (1.9%) and 24 were sophomores (7.8%). Another student identified as a “super senior,” having completed well over 120 credit hours. All but four students ( $n = 310$ ) provided their major, of

which most were elementary education (69.7%); an overview is provided in Table 9. Notably, only 6.6% of elementary education majors were males and there were none in two other majors, whereas larger proportions of males majored in social science and secondary education.

Table 9

*Preservice Teacher Majors*

<b>Major</b>	<b><i>n</i></b>	<b>%</b>	<b><i>M age</i></b>	<b>% Male</b>	<b>% Minority</b>
Elementary Education	216	69.7	23.96	6.6	39.0
Early Childhood Development & Education	30	9.7	22.90	0	31.0
Exceptional Education	13	4.2	20.62	0	23.1
Social Science Education	10	3.2	25.50	50.0	30.0
Art Education	8	2.6	21.63	12.5	75.0
Secondary Education	8	2.6	22.50	75.0	57.1
Music Education	6	1.9	21.50	16.7	16.7
Mathematics Education	4	1.3	*	*	*
English Language Arts Education	2	0.6	*	*	*
Science Education	1	0.3	*	*	*
Other or Dual Major	12	3.9	22.33	41.7	41.7
<b>Overall</b>	<b>310</b>	<b>100.0</b>	<b>23.52</b>	<b>11.4</b>	<b>38.4</b>

*Notes:* Majors are sorted in descending order by frequency. Music Education was omitted but six students wrote it in under “Other or Dual Major”; in this table it has been split off. “Minority” is Hispanic and/or not White. All percentages are for valid responses. Data is masked where  $n < 5$ .

I collected responses from 340 students, of which 11 were discarded for refusal to participate, one was discarded for being under the age of 18, and 14 were deleted for answering “no” ( $n = 13$ ) or “I am already a teacher” ( $n = 1$ ) to the question, “do you plan to become a teacher?” Although students were given the option to complete the survey on paper or online via Qualtrics, the vast majority (271 of 281; 96.4%) did so on paper. One instructor shared the



Qualtrics hyperlink with his SSE 3312 students via course announcement, which yielded two responses, and I shared the Qualtrics hyperlink with my 49 fully-online students in two sections of EME 2040: Introduction to Technology for Educators and offered 10 extra credit points (out of 750 total course points) for completing the survey. Forty-two of my students did so, of which 11 did so on paper due to being concurrently enrolled in face-to-face sections of EDF 2085,<sup>34</sup> and 31 did so on Qualtrics. In the Informed Consent section and at each course visit, I asked students who had previously taken the survey to refrain from re-taking it.

Overall, of the final sample of 314, 161 responses (51.3%) were collected in Summer and 153 (48.7%) in Fall 2019, and 271 (86.3%) were on paper whereas 43 (13.7%) were submitted via Qualtrics. Fifty-two (16.6%) responses came from students at the Clermont, Florida satellite campus and 24 (7.6%) at the Cocoa, Florida satellite campus, whereas 238 (75.8%) came from the main Orlando, Florida campus or my fully-online course. In all face-to-face visits, the majority of eligible students completed the survey. In certain visits, a large proportion were ineligible due to having already taken the survey in my prior classroom visits. There were 70 (22.3%) students who were offered extra credit, which included my 42 students as well as 28 students in an EDF 2130 class where the instructor spontaneously offered two extra credit points to complete the survey; the other 244 (77.7%) students were not offered extra credit. I have included an overview of the specific courses I visited in Table 10.

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<sup>34</sup> To maintain anonymity of their responses, I had these EDF 2085 students write their names down on a separate sheet of paper in order to award them extra credit in my EME 2040 online course.

Table 10

*Overview of Teacher Education Courses Visited*

<b>Course</b>	<b>Sections</b>	<b>Participants</b>
EDE 4223: Integrated Arts and Movement in the Elementary School	1	13
EDF 2085: Introduction to Diversity for Educators	3	29*
EDF 2130: Child and Adolescent Development for Educators	1	28^
EDF 4603: Analysis and Application of Ethical, Legal, and Safety Issues in Schools	1	24
EME 2040: Introduction to Technology for Educators	2	42^
LAE 3414: Literature for Children	2	42
LAE 4314: Language Arts in the Elementary School	2	50
MAE 3310: Elementary Mathematics for Teaching I	1	21
RED 3012: Basic Foundations of Reading	1	17
SSE 3312: Teaching Social Science in the Elementary School	4	48
<b>Totals:</b>	<b>10 Courses</b>	<b>314</b>

*Notes:* \* Total was 40 but 11 are included in EME 2040; ^ These participants received extra credit.

**MTurk Participants**

The MTurk sample ( $N = 205$ ) was restricted by screening criteria to U.S. residents ages 18–25 who are attending or have graduated from college. However, no restrictions were placed on intent to teach or gender, which resulted in a notably different sample intended to offer comparison value with the preservice teacher sample. Two participants (1.0%) were current teachers, 40 (19.5%) selected “yes” to “do you plan to become a teacher?,” 78 (38.0%) selected “maybe,” and 85 (41.5%) selected “no.” An overview of gender data is provided in Table 11; 61% were male, which contrasts starkly with the preservice teacher sample. The mean age was 23.12, with a median of 24, and a mode of 25 ( $n = 58$ ; 28.3%). Of the 199 who provided

Hispanic data, 28 (14.1%) indicated yes, which is far below the 26.5% proportion seen in the preservice teacher sample. Of these 28 participants, the most common selection was Mexican, Mexican American, Chicano ( $n = 13$ ; 46.4%). Turning our attention to 200 MTurk participants who provided their race (Table 12), this sample was predominantly but slightly less White, with a higher percentage of Asian or Pacific Islander participants as compared with the preservice teacher sample (10.5% vs. 2.7%). Overall, 63.3% ( $n = 126$ ) were non-Hispanic Whites and 36.7% ( $n = 73$ ) were Hispanic and/or not White. Although I did not ask where participants were located, based on I.P. addresses they came from across the United States with 24 I.P. addresses originating in California (11.7%), 15 in New York (7.3%), 14 (6.8%) in Florida, 10 (4.9%) in Illinois, 10 (4.9%) in Texas, and 10 (4.9%) in Washington, D.C.<sup>35</sup>

Table 11

*Gender of MTurk Participants*

<b>Gender</b>	<b><i>n</i></b>	<b>%</b>	<b><i>M age</i></b>	<b>% Minority</b>
Female	77	37.7	22.87	37.3
Male	125	61.3	23.28	36.1
Non-binary	1	0.5	*	*
<b>Overall</b>	<b>203</b>	<b>100.0</b>	<b>23.13</b>	<b>36.9</b>

*Notes:* This table excludes two participants who skipped the gender item ( $n = 1$ ) or selected “Prefer not to say” ( $n = 1$ ). “Minority” is Hispanic and/or not White and percentages are for participants who provided data ( $n = 198$ ). Data is masked where  $n < 5$ .

<sup>35</sup> Although MTurk participants may have concealed their true locations through use of proxies or virtual private networks, these are typically located in major cities. It is improbable that a majority of participants did so because there was a plethora of I.P. addresses originating from minor cities and rural areas.

Table 12

*Race of MTurk Participants*

<b>Race</b>	<b><i>n</i></b>	<b>%</b>	<b><i>M age</i></b>	<b>% Male</b>	<b>% Hispanic</b>
White	148	74.0	23.16	63.9	13.7
African American	28	14.0	22.93	60.7	7.4
Asian or Pacific Islander	21	10.5	23.10	47.6	9.5
Other	3	1.5	*	*	*
<b>Overall</b>	<b>200</b>	<b>100.0</b>	<b>23.13</b>	<b>61.8</b>	<b>13.6</b>

*Notes:* This table excludes five participants who skipped the race item ( $n = 1$ ) or selected “Prefer not to say” ( $n = 4$ ). Those who selected two or more races ( $n = 5$ ) were generally coded under a non-White race (e.g., two participants who selected White *and* Black or African American were coded as the latter). Hispanic percentages are for participants who provided data ( $n = 197$ ). Data is masked where  $n < 5$ .

**Comparison of Samples**

This section summarizes three demographic items for both samples side-by-side to aid the reader in visualizing how they compare, followed by inferential tests. Table 13 shows descriptive statistics by sample for age, Table 14 shows frequencies and percentages for gender, and Table 15 shows frequencies and percentages for minority status (i.e., participants who were non-White and/or Hispanic, Latino, or Spanish). Each table includes an additional row for the delimited sample of preservice teachers ages 18–25 that was used in Research Question 3 to facilitate comparisons to the MTurk sample, because only Turkers ages 18–25 were recruited.

Table 13

*Descriptive Statistics for Age for Both Samples*

<b>Sample / Ages</b>	<b><i>n</i></b>	<b><i>M</i></b>	<b><i>SD</i></b>	<b>Median</b>	<b>Mode (<i>n</i>)</b>	<b>Range</b>
Preservice All Ages	313	23.51	5.42	22	20 ( <i>n</i> = 56)	18–50
MTurk (18–25)	205	23.12	1.76	24	25 ( <i>n</i> = 58)	18–25
<b>Totals (Both Samples)</b>	<b>518</b>	<b>23.36</b>	<b>4.36</b>	<b>23</b>	<b>22 (<i>n</i> = 80)</b>	<b>18–50</b>
Preservice 18–25	253	21.34	1.78	21	20 ( <i>n</i> = 56)	18–25
Preservice 26–50	60	32.63	6.10	31	28 ( <i>n</i> = 10)	26–50

Table 14

*Frequencies and Percentages for Gender for Both Samples*

<b>Gender</b>	<b>Female</b>		<b>Male</b>		<b>Non-Binary</b>		<b>Total</b>
	<b><i>n</i></b>	<b>%</b>	<b><i>n</i></b>	<b>%</b>	<b><i>n</i></b>	<b>%</b>	
Preservice	272	87.7	35	11.3	3	1.0	310
MTurk (18–25)	77	37.9	125	61.6	1	0.5	203
<b>Totals (Both Samples)</b>	<b>349</b>	<b>68.0</b>	<b>160</b>	<b>31.2</b>	<b>4</b>	<b>0.8</b>	<b>513</b>
Preservice 18–25	222	88.1	27	10.7	3	1.2	252

Table 15

*Frequencies and Percentages for Minority Status for Both Samples*

<b>Minority</b>	<b>Not White and/or Hispanic</b>		<b>White and Not Hispanic</b>		<b>Total</b>
	<b><i>n</i></b>	<b>%</b>	<b><i>n</i></b>	<b>%</b>	
Preservice	116	38.4	186	61.6	302
MTurk (18–25)	73	36.7	126	63.3	199
<b>Totals (Both Samples)</b>	<b>189</b>	<b>37.7</b>	<b>312</b>	<b>62.3</b>	<b>501</b>
Preservice 18–25	88	35.5	160	64.5	248

**Inferential tests for differences between samples on demographic items.** I performed an independent samples *t*-test to compare the samples on the age variable. Normal distribution of ages for each sample was confirmed by inspection of Q–Q plots. Levene’s test for equality of variances showed that a comparison of the full preservice teacher sample (range = 18–50) to the MTurk sample (range = 18–25) violated the homogeneity of variances assumption ( $p < .001$ ), which was unsurprising given the age restriction applied to MTurk participants. The samples were not statistically significantly different in terms of ages based on a Welch *t*-test ( $p = .243$ ). Because Research Question 3 delimits to preservice teachers ages 18–25 to enhance comparability with the MTurk sample, I performed an additional *t*-test comparing the MTurk sample to the ages 18–25 preservice teacher sample. For this comparison, Levene’s test was not statistically significant ( $p = .870$ ), but a statistically significant difference was observed in ages between the samples,  $M = -1.78$ , 95% CI  $[-2.11, -1.45]$ ,  $t(456) = -10.70$ ,  $p < .001$ . Please refer to Table 13 for descriptive statistics for all samples.

I compared proportions of males and females using a chi-square test of independence. Non-binary participants were excluded due to being 1% or less of each sample. The assumption of expected frequencies per cell was satisfied. A statistically significant association between sample and gender was observed:  $\chi^2(1) = 144.049$ ,  $p < .001$ , with a large effect size ( $\phi = .532$ ; Cohen, 1988). This was unsurprising given the gender disparities between samples (Table 14).

For minority status, I compared proportions of minorities using a chi-square test of independence. The assumption of expected frequencies per cell was satisfied. There was no statistically significant association between sample and minority status:  $\chi^2(1) = 0.152$ ,  $p = .696$ , and the effect size was miniscule ( $\phi = .017$ ; Cohen, 1988). This suggests that the samples well matched in terms of overall minority status.

## **Results for Research Questions**

Herein, descriptive statistics relating to the survey data and inferential tests are detailed, organized around five research questions. Only Research Question 3 prescribed comparing the preservice teacher and MTurk samples, for which the preservice teacher sample was restricted to ages 18–25 ( $n = 253$  of 314) for comparability with the MTurk sample. Research Questions 1–2 included descriptive comparisons to the MTurk sample. An overview of the survey items that were analyzed for each research question is included in Table 16; please consult with Appendix A for the complete text of each survey item.

Table 16

*Research Questions and Applicable Survey Items*

<b>Research Question</b>	<b>Survey Items</b>
Research Question 1: Preservice Teacher Knowledge	Q5 for retirement plan familiarity, Q10 for pension vesting awareness, Q17–Q20 for FRS knowledge, Q21–Q24 for financial knowledge, and Q25 for investing knowledge
Research Question 2: Anticipated Retirement Challenges	Q26–Q31, which is the retirement challenges and expectations subscale I borrowed from Lucey and Norton (2011)
Research Question 3: How Do Preservice Teachers Measure Up?	Comparison between samples (restricted to ages 18–25) on Q21–Q24 for financial knowledge, Q5 for retirement knowledge, Q6 for possession of accounts, and Q25 for investing knowledge
Research Question 4: Career Length, Preferences, and Vesting Concerns	Q2 for anticipated teaching career length (dependent variable), Q9 for DB–DC preference, Q11 for DB–salary preference (dummy coded), and Q14 for pension vesting concern (dummy coded)
Research Question 5: Investment Allocation Sophistication	Q25 for investing sophistication (dependent variable), Q21–Q24 for financial knowledge, Q6 for account possession, Q9 for DB–DC preference, Q32 for gender, Q33 for age, Q34–Q35 for minority status, and Q37 for academic class standing

**Research Question 1: Preservice Teacher Knowledge**

This research question asked, “what is the extent of Florida preservice teachers’ knowledge regarding personal finance and investing, the Florida Retirement system, and retirement plans in general?” To investigate this, I descriptively examined responses to Q5, which asks about familiarity with various retirement plans; Q10, on their awareness of pension vesting periods; Q17–Q20, which are four yes/no questions about the FRS; Q21–Q24, which are



four quiz items assessing financial knowledge; and Q25, which asks participants to allocate retirement investments. I also make several comparisons to the MTurk sample.

**Retirement plans in general.** Regarding retirement plans in general, preservice teachers were asked about their familiarity with five types of retirement plans, on a five-point Likert scale ranging from “not at all familiar” to “extremely familiar.” MTurk participants were presented with the same item but without the two FRS plans. The results are summarized in Table 17. Preservice teachers had little familiarity with FRS plans, although 61.5% were at least somewhat familiar with Social Security and 46.8% with employer-sponsored plans. MTurk participants reported being much more familiar with all three non-FRS plans, which indicates a comparative lack of knowledge among preservice teachers.

Table 17

*Frequencies and Percentages for Familiarity With Retirement Plans (Preservice All Ages and MTurk Samples)*

Plan Type	Sample	Not at All Familiar		Slightly Familiar		Somewhat Familiar		Moderately Familiar		Extremely Familiar		Some-what+
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	%
Employer-Sponsored	Preservice	97	30.9	70	22.3	69	22.0	55	17.5	23	7.3	<b>46.8</b>
	MTurk	10	4.9	32	15.6	55	26.8	68	33.2	40	19.5	<b>79.5</b>
FRS Investment	Preservice	218	69.6	47	15.0	27	8.6	18	5.8	3	1.0	<b>15.4</b>
FRS Pension	Preservice	188	60.1	63	20.1	32	10.2	23	7.3	7	2.2	<b>19.8</b>
IRA	Preservice	150	47.8	73	23.2	40	12.7	34	10.8	17	5.4	<b>29.0</b>
	MTurk	17	8.3	39	19.0	49	23.9	62	30.2	38	18.5	<b>72.7</b>
Social Security	Preservice	56	17.8	65	20.7	66	21.0	76	24.2	51	16.2	<b>61.5</b>
	MTurk	4	2.0	27	13.2	59	28.9	66	32.4	48	23.5	<b>84.8</b>

*Notes:* Preservice  $n = 313$  for FRS plans and  $N = 314$  for other plans; MTurk  $n = 204$  for Social Security and  $N = 205$  for other plans; Somewhat+ column is the percentage who were at least somewhat familiar.

**Pension vesting requirements.** I asked all participants a yes/no question about awareness of vesting requirements: “Most U.S. states offer teacher pension plans, in which teachers typically must work in that state for a minimum 5–10 year vesting period before they can receive a minimum pension at retirement age. **Were you aware of this?**” Only 35.8% of preservice teachers ( $n = 112$ ) and 42.9% of MTurk participants ( $n = 88$ ) answered yes.

**The FRS.** I asked preservice teachers four questions (Q17–Q20) regarding their knowledge of facets of the FRS. Their responses are shown in Table 18. Very few were aware of the FRS’s educational website and hotline, and scarcely more were aware of the DB–DC choice. About half (50.8%) knew that Florida participates in Social Security.

Table 18

*Preservice Teacher Knowledge of Aspects of the FRS*

<b>Aspect</b>	<b><i>n</i></b>	<b>Aware</b>	<b>Not Aware</b>
The Florida Retirement System offers teachers a choice between a pension plan and an investment plan similar to a 401(k).	303	25.7% ( <i>n</i> = 78)	74.3% ( <i>n</i> = 225)
Florida schools and teachers pay Social Security tax and can expect to receive Social Security benefits, in addition to their Florida Retirement System benefits.	311	50.8% ( <i>n</i> = 158)	49.2% ( <i>n</i> = 153)
The Florida Retirement System offers an educational website about retirement planning ( <a href="http://www.myfrs.com">www.myfrs.com</a> ).	310	13.5% ( <i>n</i> = 42)	86.5% ( <i>n</i> = 268)
The Florida Retirement System offers a free financial guidance hotline staffed with financial planners who can review your account and provide advice on retirement planning (866-446-9377).	312	6.1% ( <i>n</i> = 19)	93.9% ( <i>n</i> = 293)

**Personal finance and investing.** Participants were presented with four financial knowledge quiz items that have been widely used in past research (Lusardi & Mitchell, 2008; Peng et al., 2007). The questions, choices, and percentages of “don’t know” responses, incorrect answers, and correct answers from preservice teachers are presented in Table 19. These questions assess rudimentary financial and investing knowledge. Overall, only the savings account interest rate question was correctly answered by a majority of participants (58.3%), whereas the other items each had more than half selecting “don’t know.”

Table 19

*Preservice Teachers' Responses to Financial Knowledge Quiz Items*

<b>Item</b>	<b><i>n</i></b>	<b>Don't Know</b>	<b>Incorrect Answer</b>	<b>Correct Answer</b>
Q21: Over the last 30 years in the United States, the best average returns have been generated by which one of the following? (Bonds, CDs, Money market accounts, Precious metals, <b>Stocks</b> ?)	310	77.4% ( <i>n</i> = 240)	9.4% ( <i>n</i> = 29)	13.2% ( <i>n</i> = 41)
Q22: Do you think the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund. (True, <b>False</b> )	312	68.6% ( <i>n</i> = 214)	7.7% ( <i>n</i> = 24)	23.7% ( <i>n</i> = 74)
Q23: Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? ( <b>More than \$102</b> , Exactly \$102, Less than \$102)	312	25.3% ( <i>n</i> = 79)	16.3% ( <i>n</i> = 51)	58.3% ( <i>n</i> = 182)
Q24: Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy... (More than today, Exactly the same as today, <b>Less than today</b> )	311	50.5% ( <i>n</i> = 157)	20.6% ( <i>n</i> = 64)	28.9% ( <i>n</i> = 90)

**Research Question 2: Anticipated Retirement Challenges**

This research question asked, “to what extent do Florida preservice teachers anticipate facing financial challenges in funding their retirement and during retirement?” This research

question was assessed using a subscale of six questions borrowed from Lucey and Norton (2011) that they created, called the retirement challenges and expectations subscale. Each item, listed along with frequencies and percentages for both samples in Table 20, was measured on a five-point Likert scale ranging from strongly disagree to strongly agree.

Table 20

*Frequencies and Percentages for Retirement Challenges and Expectations Items (Preservice All Ages and MTurk Samples)*

Question	Sample	Strongly Disagree		Somewhat Disagree		Neither Agree Nor Disagree		Somewhat Agree		Strongly Agree	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
I expect that I will have to work during retirement.	Preservice ( <i>n</i> = 311)	44	14.1	63	20.3	81	26.0	103	33.1	20	6.4
	MTurk ( <i>N</i> = 205)	31	15.1	53	25.9	28	13.7	77	37.6	16	7.8
Student loan repayments will prevent me from funding my retirement.	Preservice ( <i>n</i> = 313)	103	32.9	49	15.7	61	19.5	76	24.3	24	7.7
	MTurk ( <i>N</i> = 205)	44	21.5	45	22.0	30	14.6	45	22.0	41	20.0
Credit cards repayments will prevent me from funding my retirement.	Preservice ( <i>n</i> = 312)	122	39.1	79	25.3	69	22.1	34	10.9	8	2.6
	MTurk ( <i>N</i> = 205)	51	24.9	64	31.2	27	13.2	49	23.9	14	6.8
I want to save for retirement, but don't think my salary will be enough to afford it.	Preservice ( <i>n</i> = 313)	35	11.2	47	15.0	64	20.4	116	37.1	51	16.3
	MTurk ( <i>N</i> = 205)	27	13.2	41	20.0	44	21.5	60	29.3	33	16.1
I want to save for retirement, but don't think I can afford to invest beyond what I will contribute to employer's retirement plan.	Preservice ( <i>n</i> = 305*)	36	11.8	34	11.1	88	28.9	110	36.1	37	12.1
	MTurk ( <i>N</i> = 205)	24	11.7	39	19.0	46	22.4	68	33.2	28	13.7
I do not need to save as much for retirement because my spouse will save enough for both of us.	Preservice ( <i>n</i> = 311)	126	40.5	47	15.1	98	31.5	28	9.0	12	3.9
	MTurk ( <i>N</i> = 205)	95	46.3	51	24.9	31	15.1	23	11.2	5	2.4

*Note:* \* Seven preservice Qualtrics participants were mistakenly not asked this item.

**Reliability analyses.** Lucey and Norton (2011) reported a Cronbach's alpha of .72 for the score reliability of this subscale, which is above the widely cited cut-off point of .7. I ran a

reliability analysis for the 301 preservice teachers (96% of sample) with complete data, as well as the 205 MTurk participants (all of which provided complete data). My findings were similar, with an alpha of .701 for preservice teachers and .800 for MTurk participants, which provides evidence of internal-consistency reliability with respect to participant responses in both samples. Notably, the spouse item was not well correlated with the other items; if removed, the alphas increased to .793 for preservice teachers and to .837 for MTurk participants.

### **Research Question 3: How Do Preservice Teachers Measure Up?**

This research question asked, “how do Florida preservice teachers compare to college students and graduates ages 18–25 on financial, retirement, and investing knowledge?” This research question centered on the utilization of the MTurk sample ( $N = 205$ ) which was limited to college students and graduates ages 18–25 using a notice in the task description and screening questions. I selected this age range because it is associated with traditionally aged college attendance. Under this research question, the preservice teacher was delimited to those who were ages 18–25 ( $n = 253$ ; 80.6%). Among the delimited preservice teacher sample, 2% were freshmen, 9.6% were sophomores, 48.6% were juniors, and 39.8% were seniors, consistent with the overall population of UCF preservice teachers (O. Smith, personal communication, October 24, 2019). Despite this heavy tilt toward juniors and seniors, the age distribution of the restricted preservice sample was roughly normal (Figure 5), whereas for MTurk it was negatively skewed with more than half of participants being 24–25 years old (Figure 6), and an independent-samples  $t$ -test showed the age distributions differed significantly:  $M = -1.78$ , 95% CI  $[-2.11, -1.45]$ ,  $t(456) = -10.70$ ,  $p < .001$ . This likely reflects that U.S. Turkers are, on average, older than UCF preservice teachers.

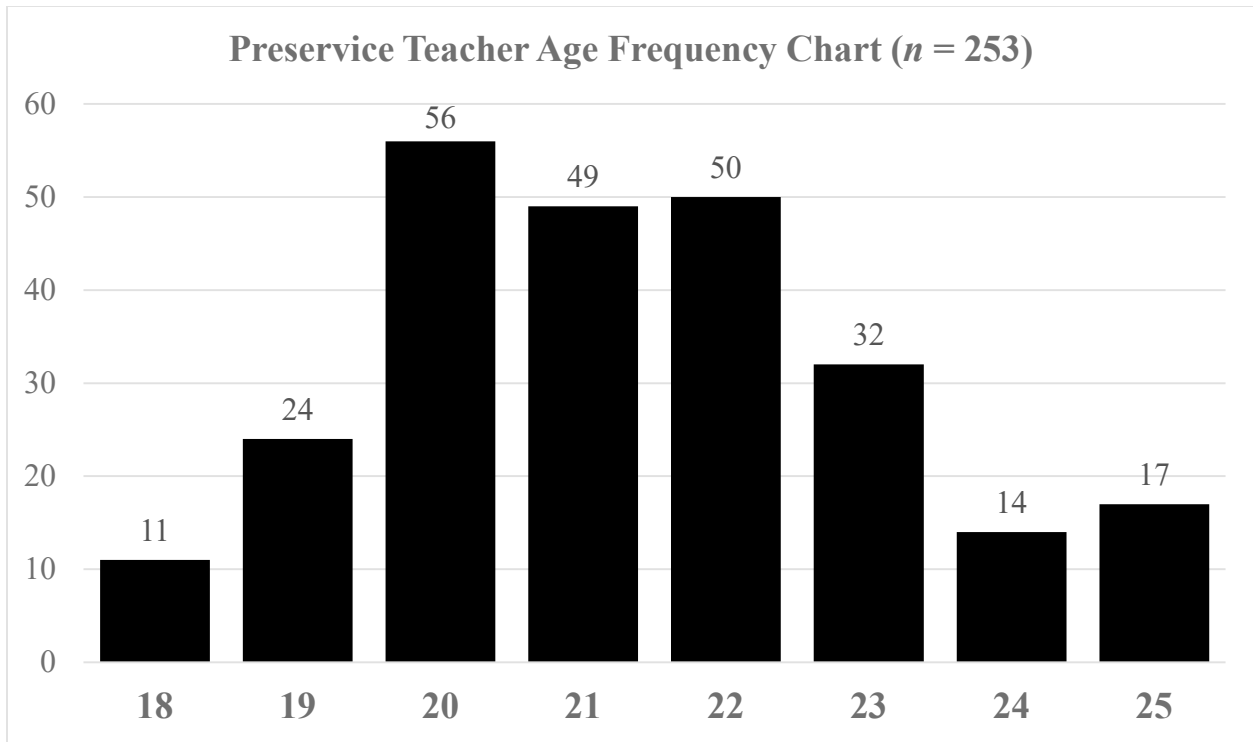


Figure 5. Chart of age distribution of preservice teacher sample restricted to ages 18–25.

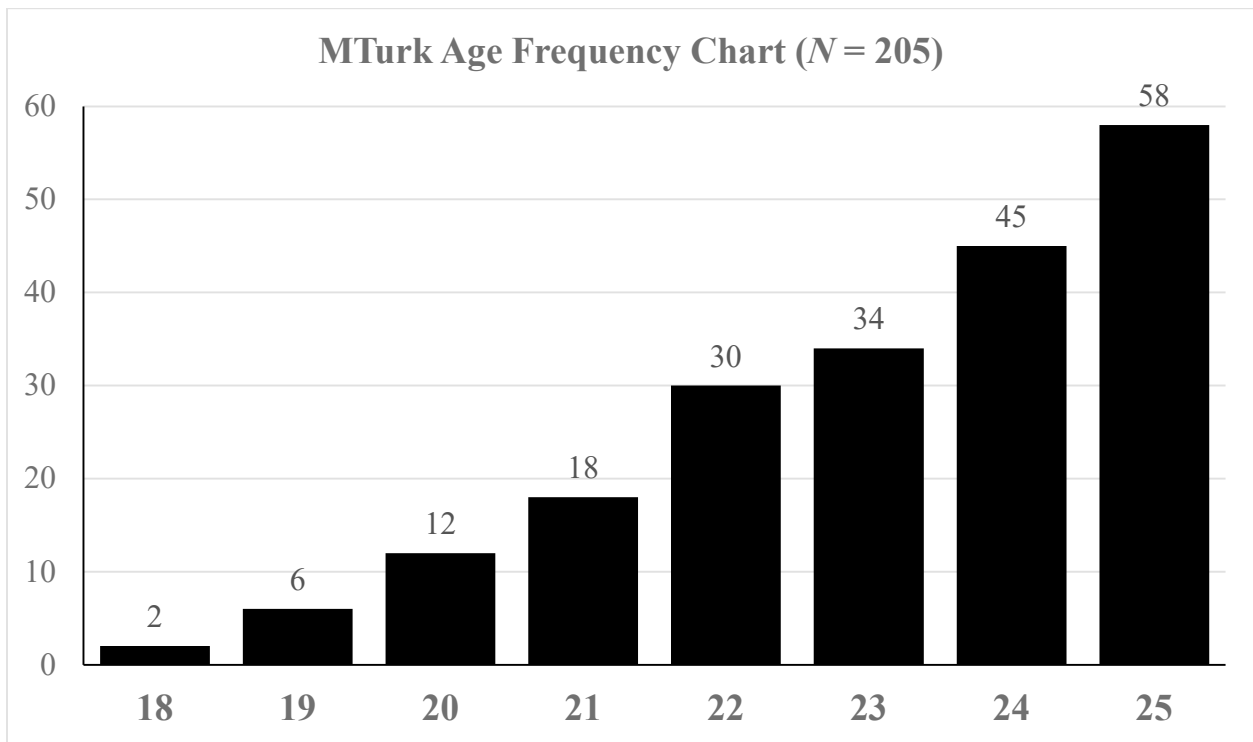


Figure 6. Chart of age distribution of MTurk sample.



**Financial knowledge.** A primary method I used to assess financial knowledge was the use of a quiz item on the best performing investments (Peng et al., 2007; correct answer is stocks) and the “Big Three” financial knowledge quiz items (Lusardi & Mitchell, 2008). See Table 30 for the full text of the items, or Appendix A to see them as presented in the survey instrument. The results for preservice teachers ages 18–25 are presented in Figure 7, and the results for MTurk participants are presented in Figure 8.

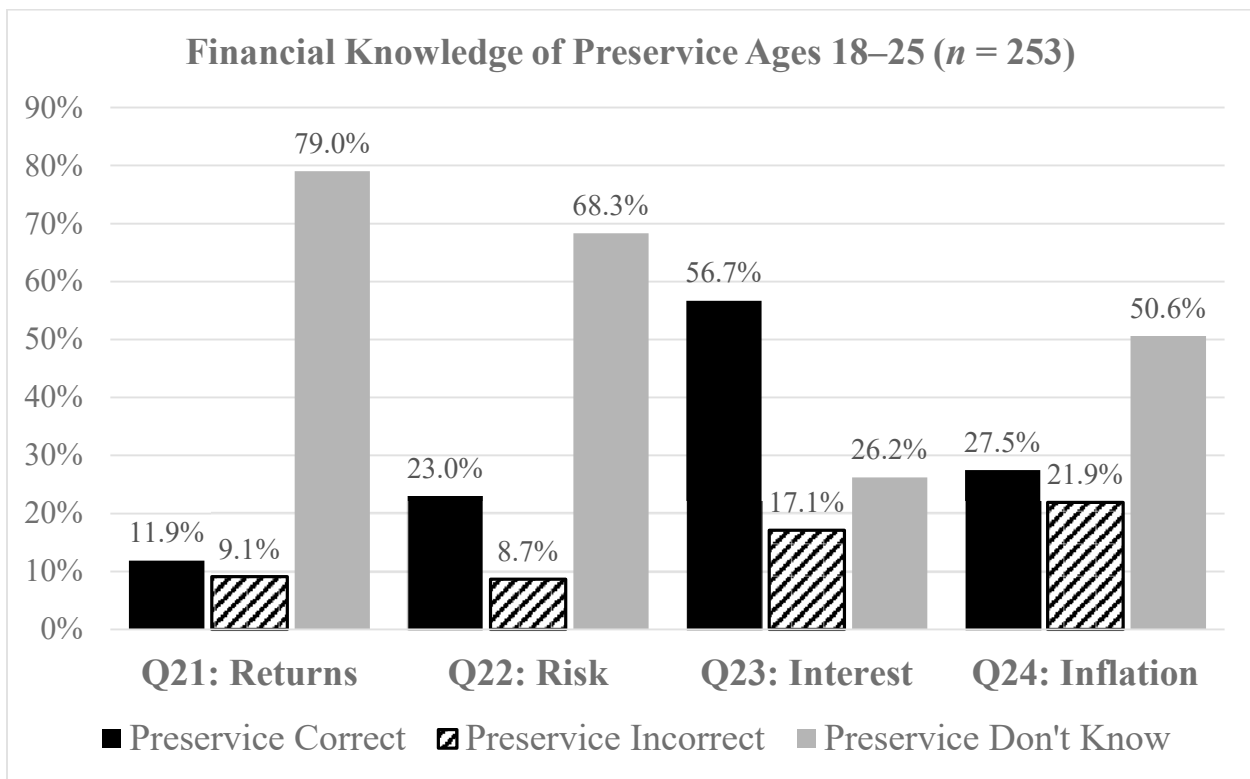


Figure 7. Chart of responses to financial knowledge items for ages 18–25 preservice sample.

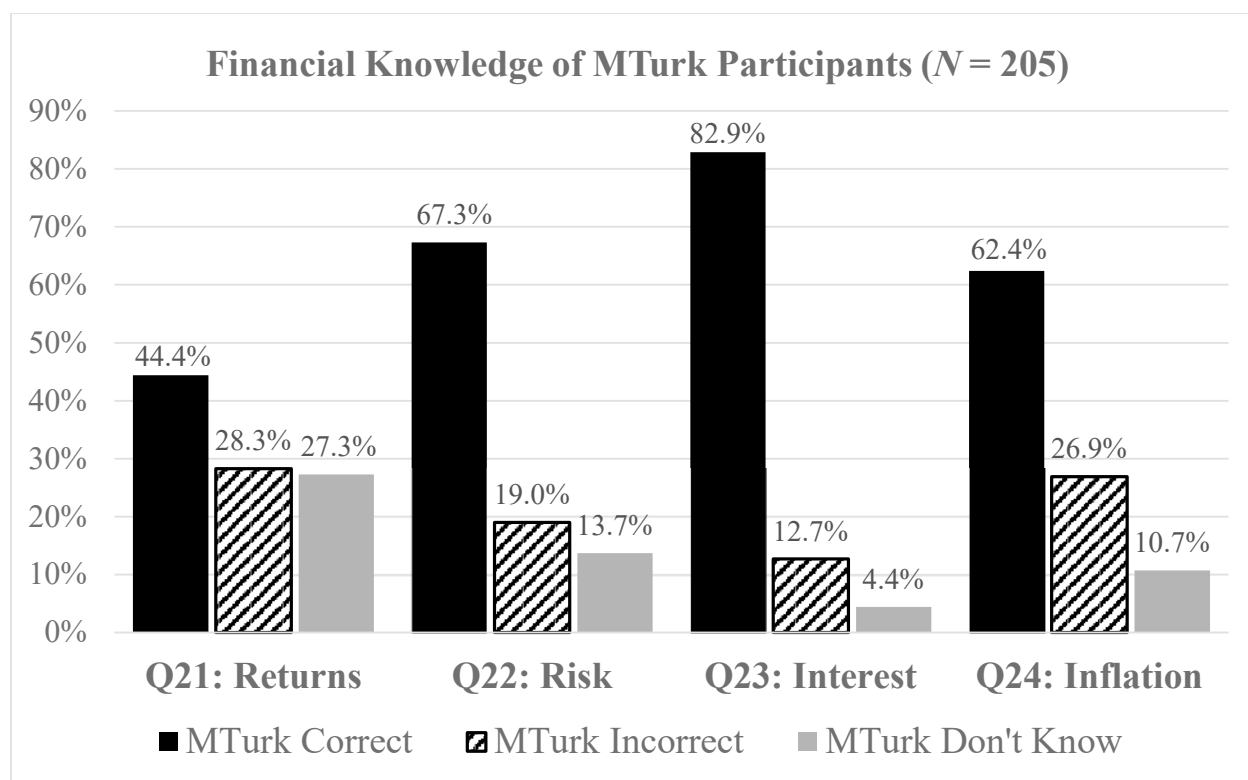


Figure 8. Chart of responses to financial knowledge items for MTurk sample.

Looking at gender differences in each sample, I saw that females chose “don’t know” more often in all eight question/sample combinations, but that the preservice teacher sample was less confident even when comparing male preservice teachers to female MTurk participants. For example, 63% of male preservice teachers (17 of 27) answered “don’t know” to Q21 on the best-performing long-term investment (stocks), whereas only 40% of female MTurk participants (31 of 77) chose “don’t know.” If I compare female preservice teachers to male MTurk participants, the gap is enormous: 80.5% (178 of 221) versus 20% (25 of 125) “don’t know” responses.

Analysis of a composite score of correct answers to the four quiz items presented in my survey showed mean composite scores on a 0–4 scale of 1.19 for preservice teachers and 2.57 for MTurk participants. Only 9.9% of preservice teachers ages 18–25 answered three or four questions correctly, whereas for MTurk participants the figure was 55.1% (Figure 9). This

composite score treated “don’t know” responses the same as selecting a wrong answer, which is consistent with Lusardi (2019) but disadvantaged the preservice teachers due to their much higher propensity to select “don’t know.”

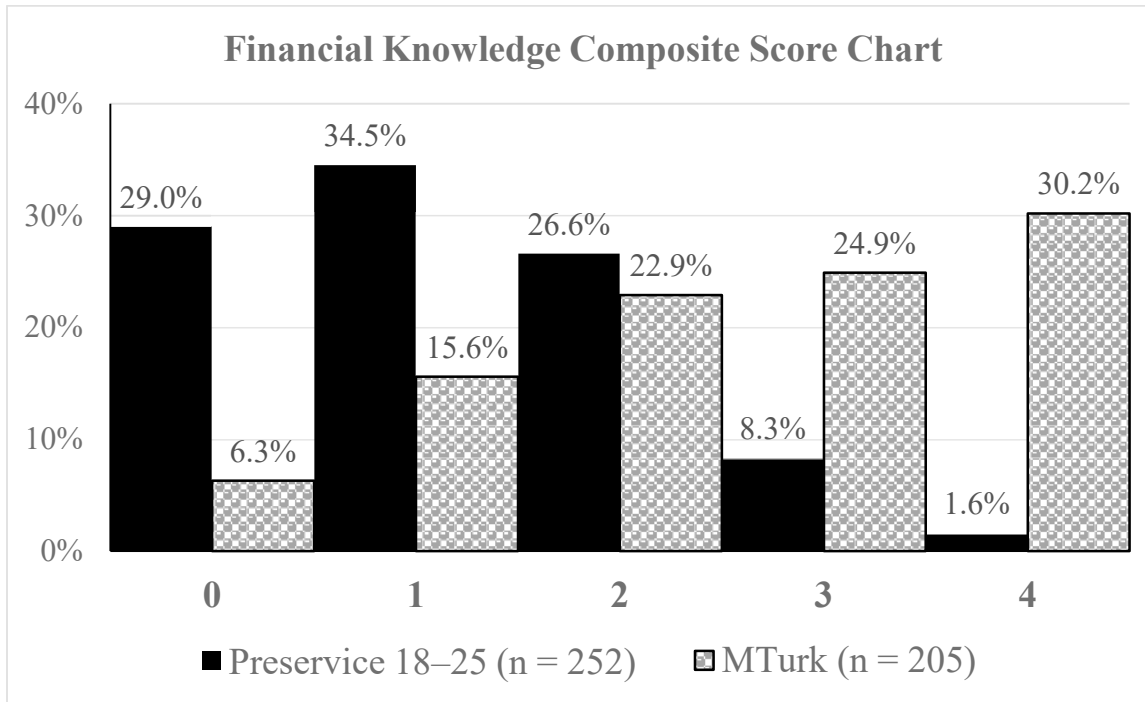


Figure 9. Chart of financial knowledge composite score (x-axis) by percentage of participants.

**Inferential test for financial knowledge composite scores.** I conducted a Mann–Whitney *U* test on the financial knowledge composite scores by group. Due to the distributions being dissimilar (Figure 9), I used mean ranks rather than medians. The test showed that financial knowledge scores for preservice teachers (mean rank = 169.16) were statistically significantly lower than for MTurk participants (mean rank = 302.56),  $U = 10,750.50$ ,  $z = -11.00$ ,  $p < .001$ . Although it is impossible to tell, from these items alone, the extent to which the preservice teachers who answered “don’t know” had an inkling of the correct answer, in the next sections I will draw connections from other collected data in order to present a more complete picture of both samples’ financial capability.

**Retirement knowledge.** Question 5 on the survey (Appendix A) asked participants about their familiarity with different types of retirement plans on five-point Likert scales ranging from “not at all familiar” to “extremely familiar.” The exact phrasing was “how familiar are you with the following types of retirement plans?” and the plans presented to both samples were “employer-sponsored retirement plans (e.g., 401[k], 403[b], 457),” “individual retirement arrangement (IRA),” and “Social Security.” The frequencies for each group are presented in Table 21, which shows that preservice teachers were less familiar than MTurk participants.

Table 21

*Frequencies and Percentages for Familiarity With Retirement Plans (Preservice Teachers Ages 18–25 and MTurk Samples)*

Plan Type	Sample	Not at All Familiar		Slightly Familiar		Somewhat Familiar		Moderately Familiar		Extremely Familiar	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Employer-Sponsored	Preservice 18–25	87	34.4	59	23.3	53	20.9	39	15.4	15	5.9
	MTurk	10	4.9	32	15.6	55	26.8	68	33.2	40	19.5
IRA	Preservice 18–25	131	51.8	58	22.9	31	12.3	22	8.7	11	4.3
	MTurk	17	8.3	39	19.0	49	23.9	62	30.2	38	18.5
Social Security	Preservice 18–25	51	20.2	49	19.4	54	21.3	58	22.9	41	16.2
	MTurk	4	2.0	27	13.2	59	28.9	66	32.4	48	23.5

*Notes:* Preservice  $n = 253$  for all plans consists of sample delimited to ages 18–25; MTurk  $n = 204$  for Social Security and  $N = 205$  for other plans (only ages 18–25 were solicited on MTurk).

I constructed a composite variable for familiarity with these three types of retirement plans, treating “not at all familiar” as a 1 and “extremely familiar” as a 5 (range = 3–15). The distributions of scores are depicted visually in Figure 10. Overall, this suggested that preservice teachers ( $n = 253$ ;  $M = 7.22$ ,  $SD = 3.281$ ) were less familiar with retirement plans than MTurk participants ( $n = 204$ ;  $M = 10.40$ ,  $SD = 2.859$ ).

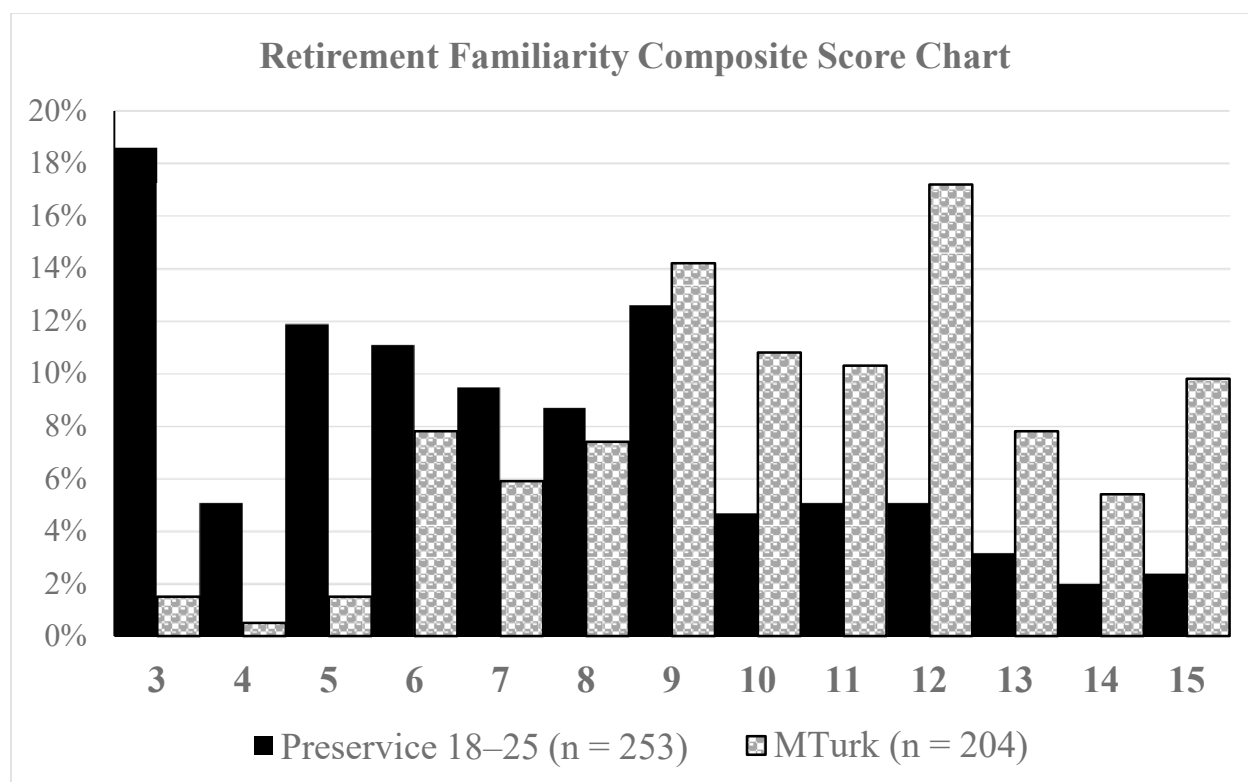


Figure 10. Chart of retirement familiarity composite score (x-axis) by percentage of participants.

**Inferential test for retirement familiarity composite scores.** I conducted a Mann–Whitney *U* test on the retirement familiarity composite scores by group, using mean ranks due to the distributions being dissimilar (Figure 10). The test showed that preservice teachers (mean rank = 174.89) were statistically significantly less familiar than MTurk participants (mean rank = 296.11),  $U = 12,115.50$ ,  $z = -9.80$ ,  $p < .001$ .

**Possession of accounts.** Of 238 preservice teachers and 197 MTurk participants who provided data, only 2.9% of preservice teachers ( $n = 7$ ) and 21.3% of Turkers ( $n = 42$ ) reported having a brokerage account. Although higher percentages of MTurk participants reported possessing all three types of accounts, most participants did not possess a 401(k) or other employer-sponsored retirement account, and IRAs were rarer still (Figure 11). Possession of a checking and/or savings account was not included in the inferential analysis due to being nearly

ubiquitous, applying to 97.5% of preservice teachers ( $n = 231$ ) and 89.8% of MTurk participants ( $n = 177$ ). A composite variable for possession of any of three types of accounts applied only to 15.1% of preservice teachers, compared with more than half (53.3%) of MTurk participants.

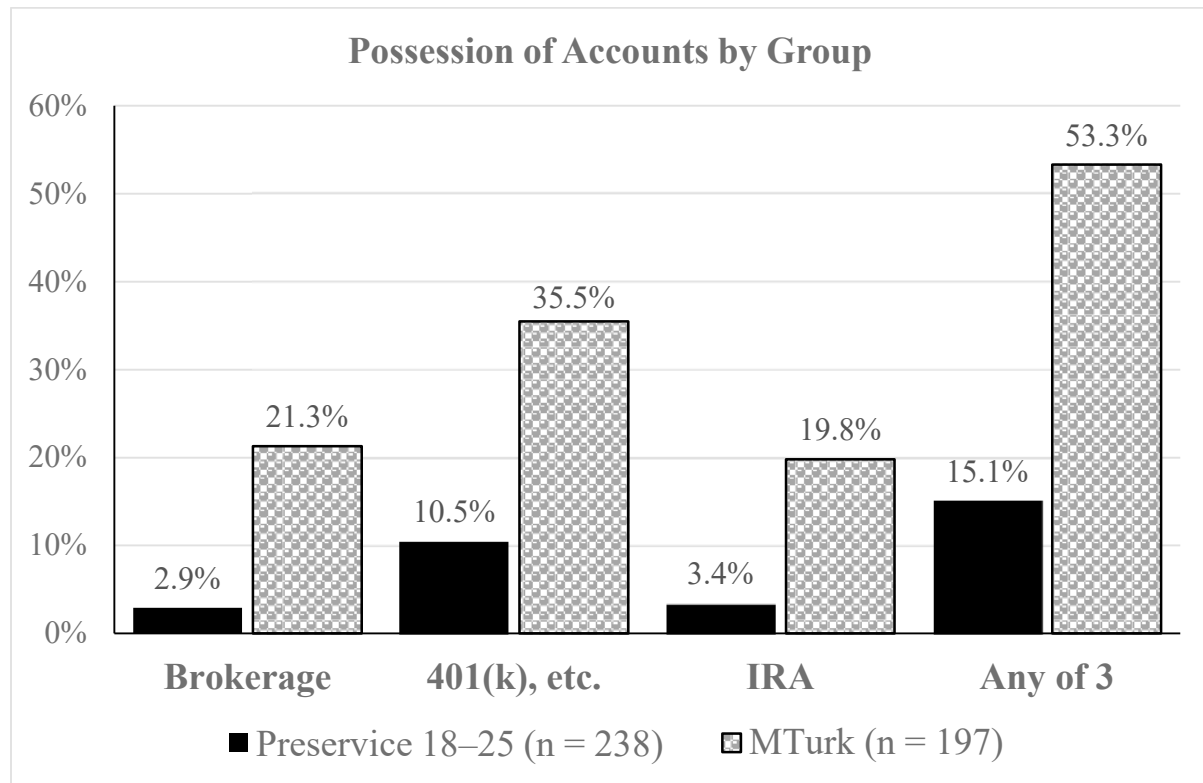


Figure 11. Chart of possession of accounts by group.

**Inferential test for possession of accounts.** To determine whether preservice teachers ages 18–25 and MTurk participants differed on the dichotomous variable for possessing at least one type of investment account (Table 22), I conducted a chi-square test of independence. The assumption of expected frequencies per cell was satisfied. A statistically significant association between group and portfolio allocation was observed:  $\chi^2(1) = 71.695, p < .001$ , with a medium to large effect size ( $\phi = .406$ ; Cohen, 1988). The adjusted standardized residuals were  $-8.5$  for account-holding preservice teachers and non-account-holding MTurk participants, and  $8.5$  for non-account-holding preservice teachers and account-holding MTurk participants, which

provides strong evidence against the null hypothesis of independence (Agresti, 2013). This shows that preservice teachers were statistically significantly less likely to have a brokerage or retirement account as compared with MTurk participants.

Table 22

*Frequencies and Percentages for Possession of a Brokerage Account, Employer-Sponsored Retirement Account, and/or IRA (Preservice Teachers Ages 18–25 and MTurk Samples)*

Possession of Accounts	One or More Account		No Accounts		Total
	<i>n</i>	%	<i>n</i>	%	
Preservice 18–25	36	15.1	202	84.9	238
MTurk	105	53.3	92	46.7	197
<b>Totals (Both Samples)</b>	<b>141</b>	<b>32.4</b>	<b>294</b>	<b>67.6</b>	<b>435</b>

**Investing knowledge.** To investigate this aspect of Research Question 3, I used portfolio allocations and good/bad classifications, which were described in detail in Chapter 3 under Data Analysis Procedures. Due to missing or unusable data on paper surveys, the preservice teacher sample was further delimited to the 202 of 253 (79.8%) preservice teachers (ages 18–25) who provided valid responses; however, all 205 MTurk responses were usable. The mean investment percentages by group are depicted in Figure 12. Both groups were too conservative for a retirement account meant to be held for 40 years, but preservice teachers were even more conservative with 51.7% of their funds directed toward the money market and bond index funds as compared with 45.7% of MTurk investments.

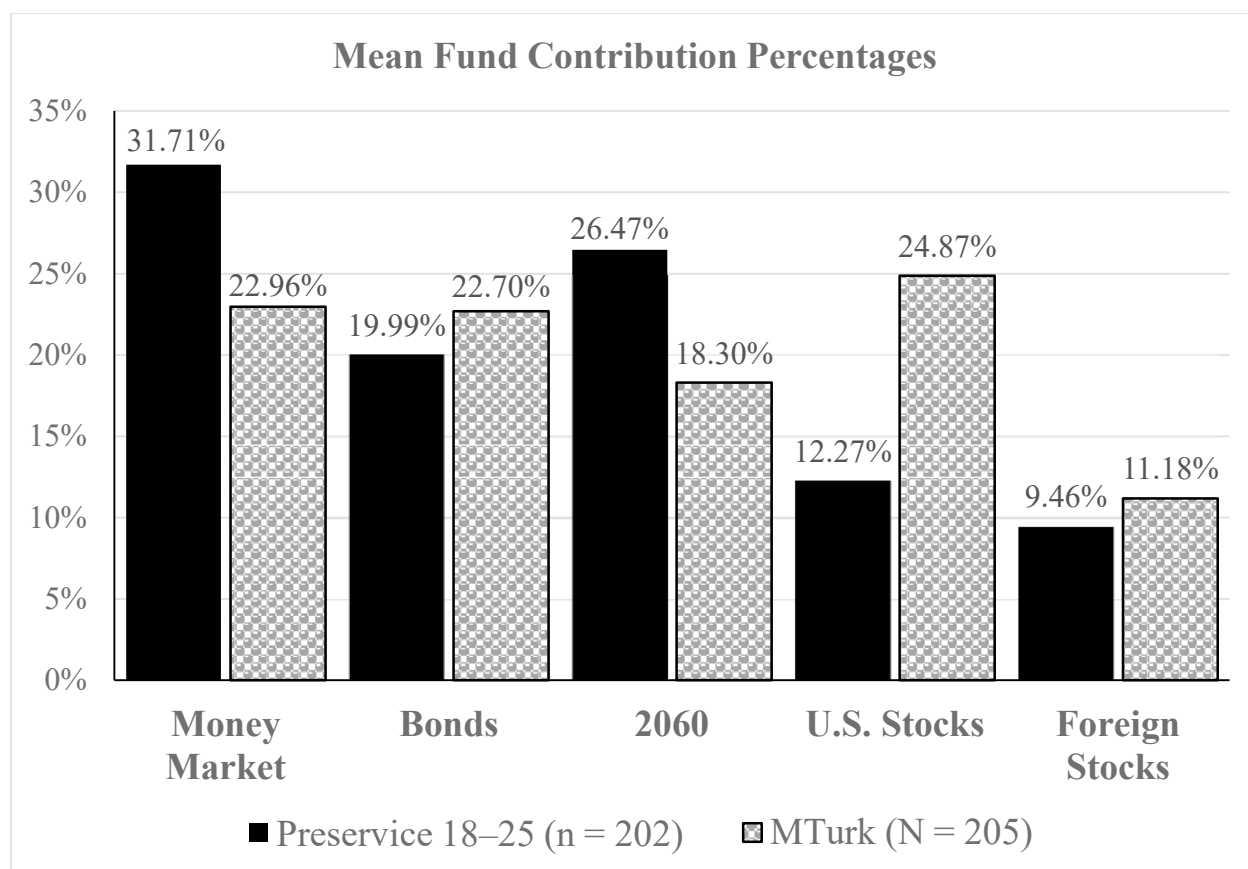


Figure 12. Chart of mean fund percentage contributions by group.

Given the classification rules that a “bad” portfolio allocates 15% or more to the money market fund or 30% or more to the money market and bond funds combined, only 17.3% of preservice teachers (35 of 202) and 27.8% of MTurk participants (57 of 205) had “good” portfolios (Figure 13). Nevertheless, 56.1% of preservice teachers ages 18–25 ( $n = 142$ ) and 51.7% of MTurk participants ( $n = 106$ ) chose a DC plan structure over a DB plan when asked their preference (Q9; Appendix A).



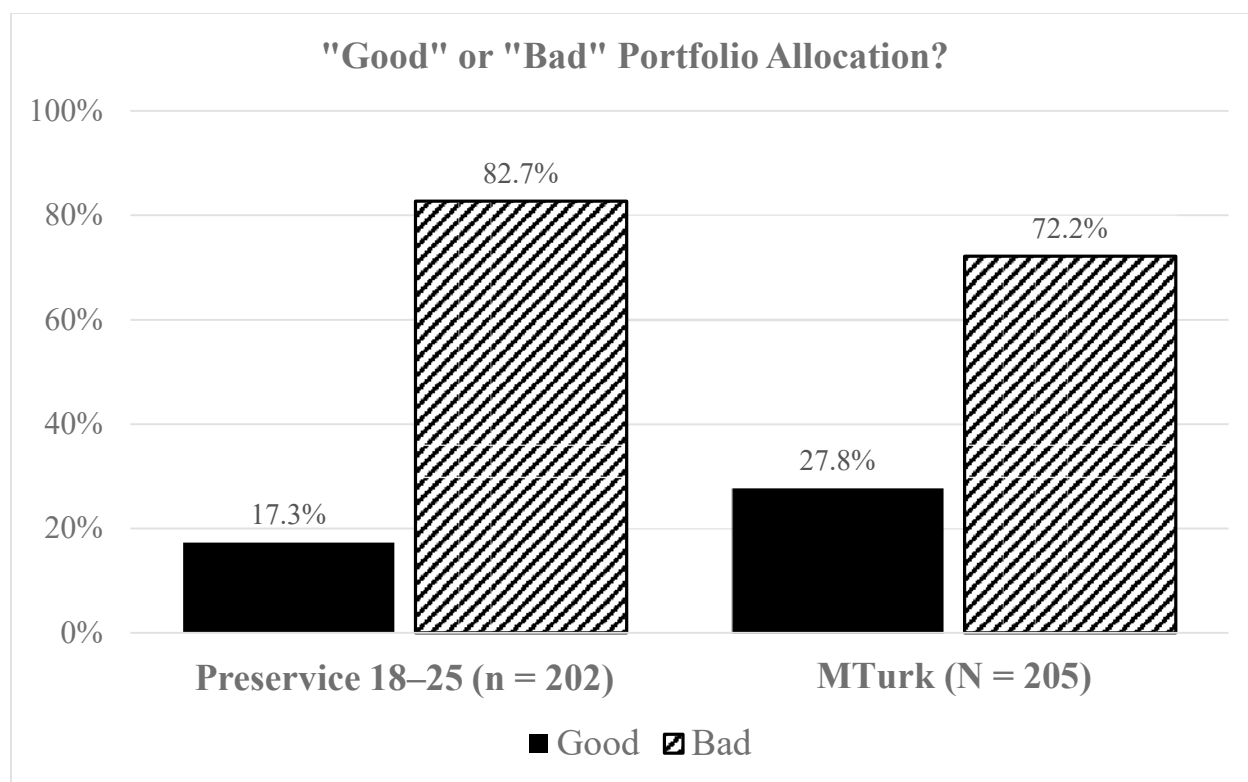


Figure 13. Chart of percentages of “good” and “bad” portfolio allocations by group.

***Inferential test for investment allocation sophistication.*** To compare whether preservice teachers ages 18–25 and MTurk participants differed with respect to the dichotomous portfolio allocation grade (Table 23), I performed a chi-square test of independence. The assumption of expected frequencies per cell was satisfied. A statistically significant association between group and portfolio allocation was observed:  $\chi^2(1) = 6.385, p = .012$ , the effect size of which was small ( $\phi = .125$ ; Cohen, 1988). The adjusted standardized residuals were  $-2.5$  for good preservice teachers and bad MTurk participants, and  $2.5$  for bad preservice teachers and good MTurk participants, which provides significant evidence against the null hypothesis of independence (Agresti, 2013). This confirms that preservice teachers were worse at directing the investment of retirement funds than MTurk participants to a statistically significant degree, if we accept the premise of the allocation exercise and the “good” versus “bad” portfolio classification rules.

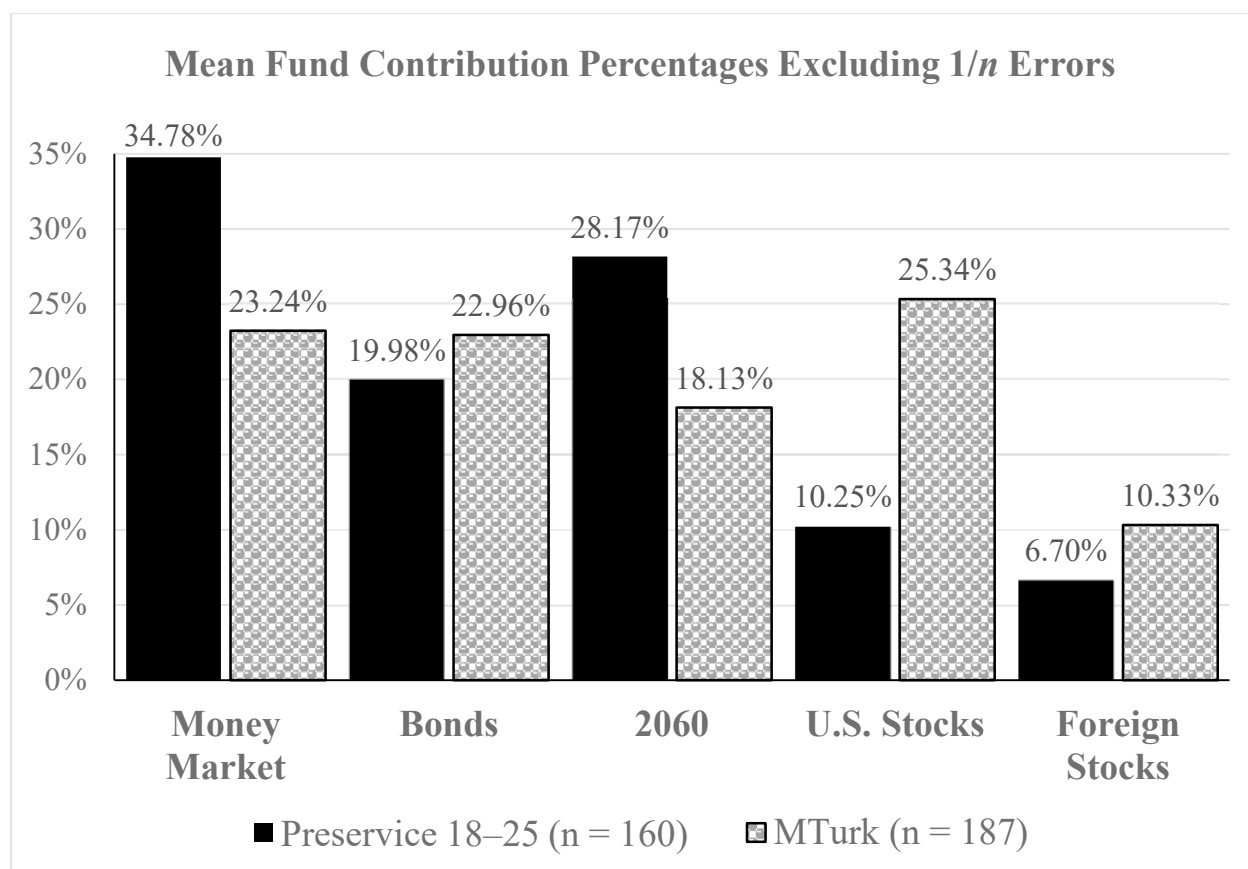
Table 23

*Frequencies and Percentages for Dichotomous Portfolio Allocation Sophistication Grades**(Preservice Teachers Ages 18–25 and MTurk Samples)*

Portfolio Grade	“Good”		“Bad”		Total
	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Preservice 18–25	35	17.3	167	82.7	202
MTurk	57	27.8	148	72.2	205
<b>Totals (Both Samples)</b>	<b>92</b>	<b>22.6</b>	<b>315</b>	<b>77.4</b>	<b>407</b>

Notes: “Good” portfolios put more than 70% in stocks and/or the 2060 target-date fund; “bad” portfolios put 15% or more in the money market fund or 30% or more in money market and bond funds combined.

**Prevalence of 1/n allocation error.** I speculated that the 1/n allocation error would be prevalent given that the choice of only five funds makes it tempting to put 20% in each (Benartzi & Thaler, 2001, 2007). This error affected 20.8% of preservice teachers, but only 8.8% of MTurk participants. In Figure 14, I present Figure 12 again, but with participants who made the 1/n error removed. By putting nearly 60% of their contributions in equities, those who made the 1/n error were actually better risk-adjusted than others, which shows as an undesirable increase from 51.7% in conservative investments among all preservice teachers ages 18–25 ( $n = 202$ ) to 54.8% among *only* preservice teachers ages 18–25 who did not commit the 1/n error ( $n = 160$ ). This would not ordinarily be the case in a retirement menu (see Mottola & Utkus, 2009).



*Figure 14.* Repeat of Figure 12 excluding participants who made the 1/n allocation error.

A chi-square test of independence on the proportions of 1/n errors found a statistically significant difference:  $\chi^2(1) = 11.679, p < .001$ , the effect size of which was small to medium ( $\phi = -.169$ ; Cohen, 1988), which shows that preservice teachers were significantly more likely to make the 1/n error than MTurk participants. Frequencies and percentages for 1/n allocation errors are included in Table 24.

Table 24

*Frequencies and Percentages for Having Made the 1/n Allocation Error, Thereby Contributing 20% to Each of the Five Fund Choices (Preservice Teachers Ages 18–25 and MTurk Samples)*

<b>1/n Error</b>	<b>Error Made (Bad)</b>		<b>Error Not Made (Good)</b>		<b>Total</b>
	<i>n</i>	%	<i>n</i>	%	
Preservice 18–25	42	20.8	160	79.2	202
MTurk	18	8.8	187	91.2	205
<b>Totals (Both Samples)</b>	<b>60</b>	<b>14.7</b>	<b>347</b>	<b>85.3</b>	<b>407</b>

#### **Research Question 4: Career Length, Preferences, and Vesting Concerns**

This research question asked: “To what extent is anticipated teaching career length predicted by DB–DC preference, DB versus salary preference, and concern about meeting Florida's eight-year DB vesting period?” This was evaluated by multiple linear regression analysis with anticipated teaching career length in years as the dependent variable and the other items as independent variables. For Research Question 4, the sample was delimited to the 250 of 314 preservice teachers (79.6%) who provided valid data for all four items.

**Anticipated career length.** The regression’s dependent variable was based on responses to this item: “How many total years do you expect to work as a teacher? If you are currently teaching or have taught in the past, please include those years in your estimate. Please answer in whole numbers only (e.g., 20).” Three paper participants and one Qualtrics participant skipped this item, and another 50 paper participants were excluded for providing non-standard responses that used number ranges, plus (+) or inequality signs (< or >), or elaborations such as “2 years as a substitute,” “10ish,” “20 Don’t know,” “25?,” and “30 (maybe more).” Outlier values from three participants who answered 0, 70, and 100 years were excluded due to being implausible.

For this item, 57 participants were excluded leaving 257 valid responses, of which seven more were excluded from analysis due to having missing data on one or more of the independent variables, resulting in a sample of 250 ( $M = 25.45$ ,  $Mdn. = 25$ ,  $SD = 11.24$ , range = 2–55).

**DB–DC preference.** This independent variable was based on the following item:

If offered a choice between the following two types of retirement plans, which one would you choose? (Please circle only one.)

- a. A defined-benefit pension plan where you do not need to make any investment decisions. Your pension is based on pay grade and years of service.
- b. Selecting and managing your own investments in a defined-contribution retirement account such as a 401(k).

Of 250 preservice teachers who provided valid responses for all items considered under this research question, 115 (46.0%) selected the pension plan and 135 (54.0%) selected the defined contribution plan. This preference for managing one’s own investments may be ill-advised due to low investing literacy, shown in results to Research Questions 3 and 5.

**DB versus salary preference.** This independent variable used responses to this item:

If given the choice between a pension plan or a salary increase of equivalent value, which would you prefer? (Please circle only one.)

- a. Strongly prefer pension plan
- b. Somewhat prefer pension plan
- c. Neither option preferred
- d. Somewhat prefer salary increase of equivalent value
- e. Strongly prefer salary increase of equivalent value

Of 250 preservice teachers who provided valid responses for all items considered under this research question, only 23.6% ( $n = 59$ ) expressed a preference for a salary increase of equivalent value, whereas 40.0% ( $n = 100$ ) preferred a pension plan. For the regression model, responses were collapsed and dummy coded with “neither option preferred” as the reference category ( $n = 91$ ; 36.4%), and the “somewhat prefer” and “strongly prefer” choices collapsed for pension plans and salary increases (Table 25). Note that it was left up to participants to decipher the meaning of “a salary increase of equivalent value,” and not all participants may have understood this.

Table 25

*Frequencies and Percentages for DB Versus Salary Preference Item for Research Question 4 (Preservice Teachers)*

<b>DB–Salary Preference</b>	<b><i>n</i></b>	<b>%</b>	<b>Collapsed <i>n</i></b>	<b>Collapsed %</b>
Strongly prefer pension plan	36	14.4	100	40.0
Somewhat prefer pension plan	64	25.6		
Neither option preferred	91	36.4	<i>Reference category</i>	
Somewhat prefer salary increase	46	18.4	59	23.6
Strongly prefer salary increase	13	5.2		
<b>Total</b>	<b>250</b>	<b>100.0</b>		

**Level of concern about not meeting Florida’s eight-year DB vesting period.** This independent variable used responses to the following question:

Florida has an **8-year vesting period** for teachers enrolling in the Florida Retirement System pension plan, which means that you will not receive your pension unless you are employed in the Florida system for at least 8 years. How concerned would you be about **not** meeting the vesting requirement (e.g., due to moving to another state or changing professions)?

- a. Not at all concerned
- b. Slightly concerned
- c. Somewhat concerned
- d. Moderately concerned
- e. Extremely concerned

Of 250 preservice teachers who provided valid responses for all items considered under this research question, only 20.0% ( $n = 50$ ) were moderately or extremely concerned about not meeting the vesting requirement, whereas slightly more than half ( $n = 126$ ; 50.4%) were not at all or slightly concerned. For the regression model, responses were collapsed and dummy coded with “somewhat concerned” as the reference category ( $n = 74$ ; 29.6%). For a more parsimonious model, responses of “not at all” and “slightly concerned” were collapsed, as were “moderately” and “extremely concerned” (Table 26).

Table 26

*Frequencies and Percentages for Concern About Vesting Item for Research Question 4  
(Preservice Teachers)*

<b>Vesting Concern</b>	<b><i>n</i></b>	<b>%</b>	<b>Collapsed <i>n</i></b>	<b>Collapsed %</b>
Not at all concerned	73	29.2	126	50.4
Slightly concerned	53	21.2		
Somewhat concerned	74	29.6	<i>Reference category</i>	
Moderately concerned	27	10.8	50	20.0
Extremely concerned	23	9.2		
<b>Total</b>	<b>250</b>	<b>100.0</b>		

**Multiple linear regression analysis.** The above data was entered into a multiple linear regression analysis with anticipated teaching career length as the dependent variable and forced

entry of the dichotomous DB–DC preference item, two dummy-coded DB versus salary preference items, and two dummy-coded vesting concern items as independent variables, for the purpose of examining the independent variables’ contributions, if any, to anticipated teaching career length. The independence of observations assumption was confirmed by a Durbin–Watson statistic of 1.824, which indicates independence of residuals. Normality of the dependent variable was confirmed by examining a Q–Q plot. The assumptions of linearity and homoscedasticity were supported by examination of a plot of the studentized residuals against the predicted values. Linearity between dependent and independent variables was supported by examination of partial regression plots; however, four of five plots were horizontal indicating no linear relationship. Only the plot for moderate/extreme vesting concern showed a linear relationship—being “moderately” or “extremely concerned” about not meeting the vesting requirement was negatively correlated with anticipated teaching career length. Variance inflation factors for independent variables ranged from 1.031 to 1.391, indicating an absence of multicollinearity. No studentized deleted residuals exceeded  $\pm 3$  standard deviations, all leverage values were below 0.2, and the highest Cook’s distance was 0.084, which suggests that no data points were overly influential.

The multiple regression model was not statistically significant:  $F(5, 244) = 1.980$ ,  $p = .082$ , adjusted  $R^2 = .019$ . Thus, Research Question 4 was not supported. Anticipated teaching career length could not be predicted by DB–DC preference, DB versus salary preference, and concern about not meeting Florida’s eight-year DB vesting period. Of the predictors, only the dummy coded variable for being moderately or extremely concerned about the vesting requirement was statistically significant ( $p = .021$ ). Regression coefficients and standard errors are detailed in Table 27.



Table 27

*Multiple Regression Predicting Anticipated Teaching Career Length (Preservice Teachers)*

<b>Variable</b>	<b><i>B</i></b>	<b><i>SE<sub>B</sub></i></b>	<b><i>β</i></b>	<b><i>t</i></b>	<b><i>p</i></b>
Intercept (Career Length)	27.802	1.724		16.127	< .001
DB–DC Preference (DC)	1.812	1.434	.081	1.264	.208
Pension Preferred	–.0879	1.641	–.038	–0.536	.593
Salary Preferred	–3.088	1.871	–.117	–1.651	.100
Vesting Low Concern	–2.569	1.660	–.115	–1.547	.123
Vesting High Concern	–4.766	2.051	–.170	–2.324	<b>.021</b>

*Notes:* Total  $n = 250$ ;  $B$  = unstandardized regression coefficient;  $SE_B$  = standard error of the coefficient;  $\beta$  = standardized coefficient; reference category for DB–DC preference: DB; Vesting Low Concern = “not at all” or “slightly concerned”; Vesting High Concern = “moderately” or “extremely concerned.”

**Research Question 5: Investment Allocation Sophistication**

This research question asked: “To what extent is the investment allocation sophistication of preservice teachers predicted by financial knowledge, possession of financial or retirement accounts, DB–DC preference, and demographic characteristics?” This question centered around the portfolio allocation exercise (Figure 3; see Chapter 3 for methodology).

This exercise was presented to all participants, although the Qualtrics version showed a dynamic total at the bottom and preventing the participant from proceeding via a prompt if their total did not sum to 100%. Therefore, there was no missing data for the 43 preservice teachers responding via Qualtrics. However, due to missing data on paper responses, only 243 of 314 (77.4%) preservice teacher responses were valid. The majority of the 71 participants with missing data completely skipped the item, with several writing that they were confused by the item or that they need to learn more about investing. Nineteen of the 71 excluded participants

wrote numbers similar to management fees (expense ratios) in each blank or numbers that did not sum to 100%, despite the inclusion of a checkbox asking them to double-check their math.

For Research Question 5, the sample was delimited to the 220 of 314 preservice teachers (70.1%) who provided valid data for all variables included within the regression model. Besides the aforementioned 71 participants who did not provide usable data on the portfolio allocation exercise, an additional 22 were excluded for not providing data on one or more independent variables (i.e., financial knowledge, possession of accounts, DB–DC preference, age, gender, class standing, or minority status). Because gender was dichotomized in the model, one additional participant was excluded for being non-binary / third gender.

Recall that for participants Age 29 or younger, a “good” portfolio had less than 15% in the money market fund and less than 30% to the money market and bond funds combined. Of 220 preservice teachers who provided valid responses for all items considered under this research question, only 7.3% were 30 or older ( $n = 16$ ). For these participants, recall that I adjusted the requirements for a “good” portfolio to contributing *less* than 20% to the money market fund and less than 50% to the money market and bond funds combined. This rule had the benefit of automatically classifying  $1/n$  errors (Benartzi & Thaler, 2001, 2007) as “bad” on the basis of such participants allocating 20% to the money market fund. The oldest participant was 46, and only three participants (1.4%) were over 40, which means that given a typical retirement age, even the oldest participants should invest the majority of their retirement monies in equities. Unfortunately, even these fairly lenient rules resulted in only 20.9% of preservice teachers (46 of 220) being classified as “good.”

**Financial knowledge composite score.** The financial knowledge quiz items (Q21–Q24; Appendix A) were incorporated as an independent variable using a composite score with a range

of 0–4 for answering zero, one, two, three, or all four questions correctly ( $M = 1.37$ ,  $Mdn. = 1$ ,  $SD = 1.01$ ; see Table 28). I treated “don’t know” responses the same as incorrect answers, which is consistent with Lusardi (2019) and other researchers who have used these questions. Of 220 preservice teachers who provided valid responses for all items considered under this research question, three were retained who skipped one of the four financial knowledge items (counted as incorrect), whereas the other 217 responded to all four items.

Table 28

*Frequencies and Percentages for Financial Knowledge Score for Research Question 5  
(Preservice Teachers)*

<b>Questions Correctly Answered</b>	<b><i>n</i></b>	<b>%</b>
None	48	21.8
1 of 4	76	34.5
2 of 4	68	30.9
3 of 4	23	10.5
4 of 4	5	2.3
<b>Total</b>	<b>220</b>	<b>100.0</b>

**Possession of accounts.** As a proxy for knowledge, as well as attitudes toward seeking information, the possession of certain types of financial accounts may be useful. In the 2018 National Financial Capability Study, for instance, only 35% of the unbanked said they would feel comfortable visiting a financial institution to “ask a question about a product or service,” whereas 74% of banked participants stated so (FINRA, 2019). In the survey, a checkbox list asked participants if they own a brokerage account, checking and/or savings account, employer sponsored retirement plan, FRS plan, and/or IRA. Those who checked “Prefer not to say” or no boxes were not included among 220 preservice teachers considered under this research question.

Possession of a checking and/or savings account was nearly universal ( $n = 215$ ; 97.7%). However, only 15.0% ( $n = 33$ ) reported having an employer-sponsored retirement account (e.g., 401[k]), and for the other three types, the most common was an IRA ( $n = 12$ ; 5.5%; Figure 15).

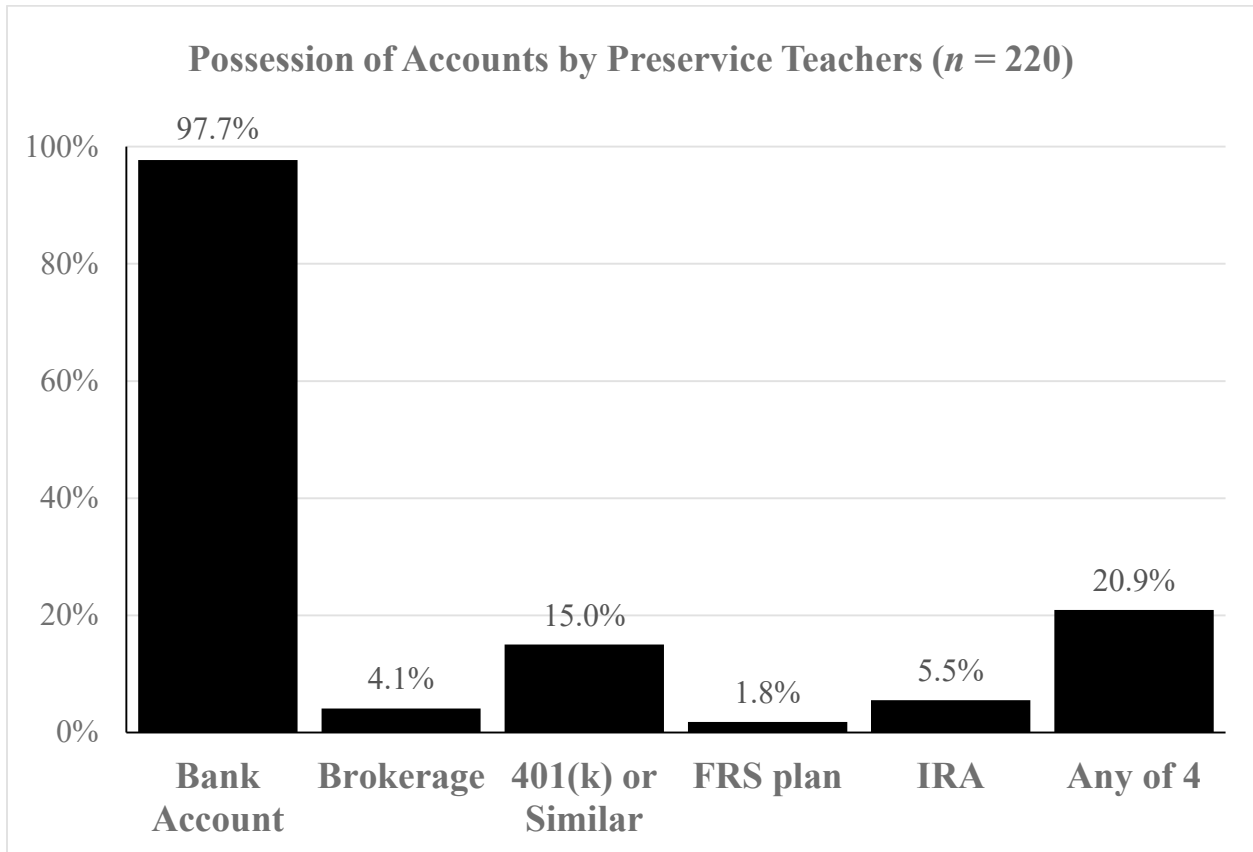


Figure 15. Chart of preservice teachers' account possession for Research Question 5.

For purposes of analysis in this research question, possession of a bank account was of little value due to only five preservice teachers (2.3%) being unbanked. However, the creation of a binary composite variable for having at least one of the other four types of accounts was more useful and was incorporated as an independent variable, applying to 20.9% ( $n = 46$ ) of preservice teachers. Regarding the 1.8% ( $n = 4$ ) of preservice teachers who reported already having an FRS plan, they may be employed by the State of Florida or its subdivisions (e.g., county agencies, cities, schools, state colleges) in a non-teaching capacity, or may have checked the box in error.

**DB–DC preference.** This independent variable was based on the item, “if offered a choice between the following two types of retirement plans, which one would you choose?”:

- a. A defined-benefit pension plan where you do not need to make any investment decisions. Your pension is based on pay grade and years of service.
- b. Selecting and managing your own investments in a defined-contribution retirement account such as a 401(k).

Of 220 preservice teachers who provided valid responses for all items considered under this research question, 98 (44.5%) selected the pension plan and 122 (55.5%) selected the defined contribution plan, which suggests a preference for control over one’s investments.

**Demographics.** For the delimited sample considered in this research question ( $n = 220$ ), age was included in the multiple logistic regression model as a continuous variable ( $M = 22.70$ ,  $Mdn. = 21$ ,  $SD = 4.485$ , range = 18–46), being that participants provided their exact age in years. Gender, academic class standing, and minority status were dichotomized prior to inclusion, as male ( $n = 29$ ; 13.2%) or female ( $n = 191$ ; 86.8%), senior ( $n = 81$ ; 37.3%) or junior or below ( $n = 138$ ; 62.7%), and White *and* non-Hispanic ( $n = 141$ ; 64.1%) or *not* White and/or Hispanic ( $n = 79$ ; 35.9%), respectively. Gender was dichotomized; one third-gender participant was removed because modeling a level of a categorical independent variable with only one member is not feasible (this participant provided complete data and  $n$  would have been 221 if included). Academic class standing and minority status were dichotomized for parsimony, given the higher proportions of seniors and non-Hispanic Whites observed in the sample.

**Multiple logistic regression analysis.** I used the Box-Tidwell (Box & Tidwell, 1962) procedure to assess the linearity of the age and financial knowledge composite variables with respect to the logit of portfolio allocation sophistication, which involved running the complete

model with the addition of an interaction effect between the two continuous variables and their respective natural logs. Tabachnick and Fidell (2014) advise applying a Bonferroni correction to the  $p$  value; due to the new model having 10 predictors, this means the assumption of linearity should be rejected if  $p < .005$ . Because  $\ln(0)$  is undefined,  $n$  was reduced from 220 to 171 due to the exclusion of 49 participants with a financial knowledge score of zero. The assumption of linearity was not violated for age ( $p = .682$ ) nor for financial knowledge ( $p = .172$ ). In order to include all 220 participants, I re-ran the analysis adding a constant of 1 to all financial knowledge scores prior to executing the natural log transformation, which did not change the outcome ( $p = .579$  for age and  $p = .040$  for financial knowledge).

Regarding outliers, the logistic regression with seven independent variables produced seven standardized residuals exceeded two standard deviations, ranging from 2.465 to 3.389 with only two being over 3.0, but these cases were retained. The model erroneously predicted that all seven would be in the “bad” portfolio group, but these participants had “good” portfolio (i.e., they allocated less than 15% to the money market fund and less than 30% to the money market and bond funds combined; all seven were under Age 30).

The logistic regression model was statistically significant:  $\chi^2(7) = 15.153, p = .034$ . Thus, Research Question 5 was supported. The model explained 10.4% (Nagelkerke  $R^2$ ) of variance in portfolio sophistication and correctly classified 79.5% of cases—a tiny improvement over simply classifying everyone as “bad,” which would have been correct 79.1% of the time. The model correctly classified 98.3% of “bad” portfolio allocations (171 of 174) and 8.7% of “good” allocations (4 of 46). Of the seven predictor variables, only age was statistically significant ( $p = .012$ ); each one-year increase in age was associated with 1.095 times higher odds (95% CI = [1.020, 1.177]) of producing a “good” portfolio. Results are detailed in Table 29.

Table 29

*Logistic Regression Predicting Likelihood of “Good” Portfolio Allocation (Preservice Teachers)*

<b>Variable</b>	<b><i>B</i></b>	<b><i>SE</i></b>	<b>Wald</b>	<b><i>df</i></b>	<b><i>p</i></b>	<b>Odds Ratio</b>	<b>95% CI</b>
Financial Knowledge	-0.110	0.184	0.353	1	.552	0.896	[0.624, 1.286]
Accounts (Yes)	0.298	0.421	0.502	1	.479	1.347	[0.591, 3.074]
DB–DC Pref. (DC)	-0.623	0.358	3.032	1	.082	0.536	[0.266, 1.081]
Age	0.091	0.036	6.254	1	<b>.012</b>	<b>1.095</b>	<b>[1.020, 1.177]</b>
Gender (Male)	-0.339	0.557	0.370	1	.543	0.713	[0.239, 2.122]
Minority (No)	-0.574	0.360	2.539	1	.111	0.563	[0.278, 1.141]
Senior (Yes)	-0.077	0.365	0.045	1	.832	0.926	[0.453, 1.892]
Constant	-2.629	0.907	8.402	1	.004	0.072	

*Notes:* Total  $n = 220$ ; Reference categories for dichotomous variables: Accounts: No (i.e., had *none* of the following: brokerage account, employer-sponsored retirement plan, FRS plan, IRA), DB–DC Preference: DB (i.e., preferred pension), Gender: Female, Minority: Yes (i.e., non-White and/or Hispanic), Senior: No (i.e., college junior or below).

### Feedback on Overall Survey

In the final question (Q39; Appendix A), which asked participants to provide comments or feedback on difficult items, several preservice teachers noted their lack of knowledge and expressed a desire or perceived need to learn more. One stated: “This survey brought attention to the fact that I do not know enough about retirement plan options. I had trouble determining percentage amount to select for percentage of contributions to each fund.” Another matter-of-factly stated, “When talking about retirement or contributing to the funds, I got very lost and confused because I am not familiar with any aspect of those topics, which is quite concerning for my future,” whereas one was emphatically concise, writing “I need to learn A LOT!” The most common complaint was about not understanding the portfolio allocation exercise (Q25), whereas

several others critiqued that terminology should have been explained more thoroughly. There were several participants who assumed their responses would not be helpful due to their lack of knowledge, whereas others thanked me with feedback such as “thank you for making me more aware about retirement,” “this has opened my eyes to how little I know about my financial future,” “this is great insight on what I should know about,” “this has motivated me to do more research in my investment/retirement plans,” and “I need to really look at different retirement plans.” This may indicate that merely administering this survey might lead to positive financial literacy outcomes for a subset of participants, similar to Stango and Zinman's (2014) research which found that giving individuals a survey on overdraft fees reduced their propensity to incur overdraft fees over the following two years.

### **Conclusion**

The findings showed a lack of financial knowledge among UCF preservice teachers. Despite being primarily upper-level students nearing graduation, they knew little about the FRS and were unprepared to direct their own investments, although a majority preferred a DC plan structure. The MTurk comparison sample was statistically significantly (a) better at answering financial knowledge quiz items, (b) better at directing fund allocations in the FRS investment plan, (c) more familiar with several types of retirement plans, and (d) more likely to possess a retirement plan or taxable brokerage account. These findings are elucidative and troubling. When coupled with the increasingly unfavorable financial environment that teachers face (Allegretto & Mishel, 2016; Rhee & Joyner, 2019), Florida preservice teachers are ill-prepared for the critical first decade of employment that could otherwise help establish a solid financial footing for the entirety of their lives. They are also not equipped to teach financial concepts to their students. Further discussion of findings is included in Chapter 5.



## **CHAPTER FIVE: DISCUSSION**

This chapter is primarily organized around this dissertation's five research questions. After this, there is a special discussion on gender issues, followed by sections on this study's contributions to the field, limitations, implications for financial education and policy, and recommendations for further research.

### **Discussion of Research Questions**

#### **Recapitulation**

This study investigated the financial, retirement, and investment knowledge, preferences, and concerns of 314 Florida preservice teachers and 205 MTurk participants ages 18–25 via an author-developed survey. Results showed that both samples were concerned about debts and anticipated difficulties saving for retirement. Preservice teachers in particular were bewildered when asked how they would contribute retirement monies to a menu of five funds from actual FRS investment plan choices, although both samples overly favored low-risk, low-return assets, which bodes poorly for their ability to accumulate retirement wealth throughout their lives. The financial knowledge of preservice teachers was especially limited, with disproportionately high percentages answering “don't know” to basic questions about interest, inflation, and investing (when compared with FINRA, 2019; Lusardi, 2009; and the MTurk sample). Preservice teachers were statistically significantly less knowledgeable than MTurk participants on a host of measures, and a logistic regression model predicting their portfolio allocation sophistication was statistically significant with age being positively correlated with a good portfolio. Herein, results for each research question will be discussed in further detail.

## Research Question 1: Preservice Teacher Knowledge

Surveyed UCF preservice teachers were not familiar with the retirement plans presented; in fact, only 61.5% were at least “somewhat familiar” with Social Security, which was the best-known plan. They were the least familiar with FRS plans, with only one-fourth knowing about the DB–DC choice available to them as a new Florida teacher, and only 13.5% knowing about the MyFRS website (<http://www.myfrs.com>). When asked about vesting concerns, no one appeared to know that having a “vested” FRS pension still means you will not receive payments until Age 65, with no inflation adjustment (Florida Division of Retirement, 2018). In fact, only 35.8% of preservice teachers knew about pension vesting periods at all (Q10). This suggests, particularly being that the sample was 90% college juniors and seniors who are likely to become teachers in two years or less, that financial education initiatives should be pursued. These could originate from the FRS or elsewhere, and could be presented in schools, colleges, and universities, to preservice and in-service teachers alike. For instance, UCF’s Office of Student Financial Assistance (2019) runs a financial literacy program called *Centsible Knights*, which could be targeted toward preservice teachers. Consider also that pension and DC plans offer little value as teacher recruitment tools if prospective teachers are not educated about them (Chalmers et al., 2014; Kimball et al., 2005).

A low level of financial knowledge among preservice teachers was further demonstrated by their responses to four financial knowledge quiz items. The majority of participants stated that they did not know the answers, and in comparing their responses on the “Big Three” questions to data from a 2018 nationwide survey (FINRA, 2019), UCF preservice teachers performed on all items, even when compared with a similar gender/age group. Lusardi (2019) writes, with respect to these financial knowledge items as applied to a broad range of individuals across the globe:

Across countries, individuals have the lowest level of knowledge around the concept of risk, and the percentage of correct answers is particularly low when looking at knowledge of risk diversification. Here, we note the prevalence of “do not know” answers. While “do not know” responses hover around 15% on the topic of interest rates and 18% for inflation, about 30% of respondents—in some countries even more—are likely to respond “do not know” to the risk diversification question. (p. 8)

In the preservice teacher sample, the percentages for “don’t know” responses to these same three questions were not 15%, 18%, and 30%, but rather 25.3%, 50.5%, and 68.6%, respectively. With the inclusion of an additional question asking what investment has performed best over the past 30 years (stocks; Peng et al., 2007), only seven preservice teachers (2.2%) answered all four correctly, and only 27 (8.6%) answered three of four correctly. This was in spite of the rudimentary nature of the questions. In comparison, 30.2% of participants in my MTurk sample answered all four questions correctly, and 24.9% got three of four correct. Consistent with past research (e.g., Brandon & Smith, 2009; Way & Holden, 2009), this suggests an urgent need to improve the financial literacy of future teachers, particularly considering that teachers’ financial and economics knowledge, or lack thereof, appears to transmit to students (Harter & Harter, 2012; Swinton et al., 2010). Overall, the next generation of Florida teachers is not set up for financial wellness due to a lack of knowledge, higher debts (Montalto et al., 2019; Scott-Clayton, 2018), and declining total compensation within the teaching field (Allegretto & Mishel, 2016).

Additional insights can be yielded from comparing the preservice sample’s responses (Table 19) to financial knowledge items to the 2018 National Financial Capability Study (Table 30) for the three items shared between my survey and the study (Q22–Q24). The overall performance of preservice teachers was much lower, with “don’t know” being much less

common in National Financial Capability Study results (FINRA, 2019). The National Financial Capability Study sample can also be restricted to females of ages 18–24, which provides more useful comparisons, being that my preservice teacher sample was 87.7% female and 75.4% were ages 18–24. Surveyed UCF preservice teachers performed worse than this subset; they ranged from 1.5 to 6.4 percentage points below the 18–24 female National Financial Capability Study participants in correct answers, and their “don’t know” percentage was higher, particularly for the inflation question (50.5% vs. 38.4%). This suggests that the preservice teachers sample is lacking in financial knowledge, both objectively and in relation to their age and gender cohort.

Table 30

*Financial Knowledge Quiz Items in 2018 National Financial Capability Study (FINRA, 2019)*

<b>Item</b>	<b>Sample</b>	<b><i>n</i></b>	<b>Don’t Know</b>	<b>Incorrect Answer</b>	<b>Correct Answer</b>
Risk question (Q22)	Nationwide	26,824	45.1%	11.1%	43.8%
	Females 18–24	1,691	62.2%	12.6%	25.2%
Interest rate question (Q23)	Nationwide	26,790	13.1%	13.6%	73.3%
	Females 18–24	1,692	20.2%	15.1%	64.7%
Inflation question (Q24)	Nationwide	26,737	21.4%	22.7%	55.9%
	Females 18–24	1,691	38.4%	30.4%	31.2%

*Notes:* Nationwide statistics are nationally weighted with weights from the dataset authors; females ages 18–24 are unweighted. I excluded “Prefer not to say” responses, which ranged from 1.0% to 1.3% of responses. In my survey (Appendix A), I did not include a “Prefer not to say” choice for these items.

## **Research Question 2: Anticipated Retirement Challenges**

This research question examined preservice teacher sentiment about financial challenges anticipated during retirement and in funding retirement accounts during their career. Responses to a six-item subscale developed by Lucey and Norton (2011) showed that the majority of

surveyed UCF preservice teachers (53.4%) agreed that they will be impeded in funding their retirements by low salaries; 48.2% also agreed that they will not be able to contribute anything outside of their employers' plans (Table 20). These responses indicated lower expectations for ability to fund one's retirement than either the MTurk sample or Lucey and Norton's (2011) results. This is surprising being that Lucey and Norton (2011) collected their survey responses in February 2008, in the midst of the financial crisis, while in 2019 the economy is strong and has been growing for 10 years. This could be related to teacher compensation having declined during this time (Allegretto & Mishel, 2016), which could have negative implications for teachers' retention, performance, and financial wellness (Ali & Frank, 2019).

Table 20 summarized frequencies and percentages for each retirement challenges item in both samples (preservice teachers and MTurk), organized by question. Strikingly, 42.0% and 30.7% of MTurk participants agreed that student loans and credit card debts would prevent them from funding retirement, compared with only 31.9% and 13.5% of preservice teachers, respectively. This suggests that MTurk workers may be using the platform for supplemental income to chip away at accumulated debts. In contrast, surveyed UCF preservice teachers had comparatively low debts, which could be related to a low cost of education due to attending an affordable, public university (Gates, 2018), and may not be representative of most Americans (cf. Moeller et al., 2016; Podolsky & Kini, 2016). Compared with Lucey and Norton (2011), the UCF preservice teacher sample was slightly less opposed to leaning on a spouse's salary, and more likely to agree that a low salary and lack of available funds will impede their retirement investing. In fact, 39.5% of surveyed UCF preservice teachers agreed they would have to work during retirement, compared to a slightly smaller proportion (34.4%) who disagreed. This is consistent with research indicating the teacher pay gap has widened (Allegretto & Mishel, 2016).

In sum, the results presented a favorable picture regarding UCF preservice teachers' current financial situations, but tempered expectations regarding future pay as teachers and ability to funding one's retirement. Although these expectations are warranted and realistic (Snell, 2012), the belief that one cannot afford to fund their retirement *and* the extent to which it is true may both have deleterious financial impacts in the long term (Lusardi & Mitchell, 2007).

### **Research Question 3: How Do Preservice Teachers Measure Up?**

This research question involved comparing the MTurk sample, which consisted of U.S. college students and graduates between the ages of 18 and 25 ( $N = 205$ ), to a delimited sample of preservice teacher participants who were between the ages of 18 and 25 ( $n = 253$ ). On every measure tested, preservice teachers did statistically significantly worse than MTurk participants.

**Gender disparity between samples.** The MTurk sample was 61% male as compared with 11% among preservice teacher ages 18–25, which was a statistically significant difference,  $\chi^2(1) = 144.049, p < .001$  ( $\phi = .532$ ). My overall preservice teacher sample was 87.7% female which matched the population of preservice teachers at UCF (O. Smith, personal communication, October 24, 2019). The gender mismatch in the MTurk sample highlighted the fact that teachers are a mostly female population, and that gender gaps that favor men in pay (Mandel & Semyonov, 2014) and financial and investing knowledge (Lusardi & Mitchell, 2008) persist and should be addressed. This is compounded by a widening teacher pay gap (Allegretto & Mishel, 2016) and ongoing erosion of retirement benefits (Chingos & West, 2015).

**Financial knowledge.** Regarding the financial knowledge quiz items, the most striking finding was the overwhelming tendency of preservice teachers to select “don't know.” The percentage of such responses was at least triple the MTurk sample for all items among preservice teachers, and five to six times greater for three of the four items (Figure 7). Data from the 2018

National Financial Capability Study also showed a gender difference where among six financial knowledge quiz items included there, females on average answered 2.0 items as “don’t know” whereas males only answered 1.2 items as such (FINRA, 2019). However, the differences between the preservice and MTurk samples far outstripped this, showing profound underconfidence among preservice teachers, which is consistent with a tendency toward cautiousness in investing among women that reduces long-term retirement portfolio growth (Lusardi & Mitchell, 2008), as well as survey data from pre- and in-service teachers showing a lack of confidence toward teaching financial skills (Henning & Lucey, 2017). In comparison, the MTurk sample was overconfident such that their percentage of *incorrect* answers was higher for all but the interest item (Figure 8). Being that preservice teachers performed statistically significantly worse than MTurk participants on the knowledge items ( $U = 10,750.50, z = -11.00, p < .001$ ), this suggests that financial education within their programs of study may be warranted.

Regarding rates of “don’t know” responses, one possibility is that preservice teachers were mentally fatigued due to the length of the survey. However, the frequency of missing data was quite low for all items except the portfolio allocation exercise, including items such as concerns about debt (Q38; Appendix A) that appeared at the end of the survey. MTurk participants may have *avoided* “don’t know” answers due to being paid for their responses. If so, they overlooked this sentence from the Informed Consent section: “However, it is perfectly fine, where applicable, to answer ‘Don’t know’ or ‘Prefer not to say’ to any items” (Appendix B).

**Retirement knowledge.** Teachers lacked knowledge about FRS plans, which was consistent with past research (Chan & Stevens, 2008; Goldhaber & Grout, 2016). Although it would not have made sense to ask MTurk participants about their knowledge of FRS plans, they reported being more familiar with employer-sponsored retirement plans (e.g., 401[k]s), IRAs,

and Social Security as compared with preservice teachers, to a statistically significant degree ( $p < .001$ ;  $z = -9.80$ ). MTurk participants were also statistically significantly more likely to have a taxable brokerage, employer-sponsored retirement account, or IRA ( $p < .001$ ;  $\phi = .406$ ). This suggests that preservice teachers' knowledge and sophistication is lacking.

**Investing knowledge.** MTurk participants were statistically significantly more knowledgeable and better at investing, but nonetheless directed 46% of their contributions to low-risk, low-yield investments. Although this is preferable to preservice teachers ages 18–25 who put even more (54%) into bonds and money markets, both percentages are excessive for individuals in their late teens or early 20s who are investing for a retirement that is 35 or more years away (Panyagometh & Zhu, 2016; Williams & Bacon, 1993). When classifying portfolios as good or bad based on being overly risk averse (bad) or not (good), MTurk participants performed significantly better ( $\chi^2[1] = 6.385$ ,  $p = .012$ ,  $\phi = .125$ ), with 28% classified as good compared with only 17% of preservice teachers. Overall, both samples did poorly, which is unsurprising given the low level of investor literacy in the United States (FINRA, 2019).

**DB–DC preference.** Regarding DB versus DC preferences, both samples leaned toward DC plans, with 56.1% of preservice teachers ages 18–25 ( $n = 142$ ) and 51.7% of MTurk participants ( $n = 106$ ) choosing DC plans over DB plans (Q9; Appendix A). This is consistent with Chingos and West's (2015) research, opposes the oft-repeated belief that teachers widely prefer DB plans (Kimball et al., 2005; Morrissey, 2017), and reinforces Ettema's (2011) research which found only 29% of surveyed pre- and in-service teachers selected a pure DB plan, while also showing similar tendencies in an MTurk comparison sample. Given their poor choices of investments in the retirement investment allocation exercise, both samples' preference for directing their own investments in DC plans may be financially unwise.



*1/n portfolio error.* Another item of interest was prevalence of the  $1/n$  portfolio allocation error (Benartzi & Thaler, 2001, 2007). Preservice teachers were more susceptible, with 20% committing this error as compared with only 9% of MTurk participants ( $\chi^2[1] = 11.679, p < .001, \phi = -.169$ ). Particularly with a small number of fund choices, a common heuristic method for those who lack knowledge and/or are conserving cognitive resources is to evenly divide contributions between the available choices. My menu had five choices, so a  $1/n$  error meant putting exactly 20% in each of the choices. Although the fund choices I included were all relatively good, succumbing to the  $1/n$  error still resulted in participants investing too much in low-risk investments and dividing their contributions between a retirement target-date fund and stock and bond index funds, which is not advised (Mitchell et al., 2008). The difference between groups presents further evidence that preservice teachers' investing knowledge was lacking.

#### **Research Question 4: Career Length, Preferences, and Vesting Concerns**

Although the multiple regression analysis to determine whether anticipated teaching career length could be predicted by vesting concerns or DB, DC, or salary preferences was not statistically significant, several findings of interest emerged in responses. A majority (54.2%) of preservice teachers preferred managing their own investments in a DC plan over a DB plan based on pay and years of service, despite the fact that participants expected to teach for a mean and median of 25 years. This could be related to increasing worker mobility seen throughout society (Hess, 2009), which can significantly penalize teachers who do not persist within a single state or pension system (Costrell & Podgursky, 2010). In fact, many participants may have been unsure about how long they will work as a teacher—18.7% of paper participants (50 of 268) gave answers including number ranges or other symbols despite being asked to “answer in whole numbers only (e.g., 20).” However, only 20.0% were moderately or extremely concerned about

the FRS DB vesting period. compared with 50.4% who were not at all or slightly concerned, suggesting that most were confident they will teach for at least eight years in Florida.

Nonetheless, it bears repeating that preferences toward self-directed DC plans may be ill-advised (seen also among FRS members in Ali & Frank, 2019; Chingos & West, 2015), given preservice teachers' low levels of financial and investing knowledge evidenced in other areas of the survey.

### **Research Question 5: Investment Allocation Sophistication**

The overall multiple logistic regression model was statistically significant ( $\chi^2[7] = 15.153, p = .034, \text{Nagelkerke } R^2 = .104$ ), with age being the only significant predictor of a “good” or “bad” portfolio allocation, 95% CI [1.020, 1.177]. This was consistent with the tendency of older investors to make better decisions (Morrin et al., 2012), although a large proportion of Americans nonetheless arrive at retirement with few assets (Lusardi & Mitchell, 2007), particularly women and minorities (Hasler et al., 2018). This is especially relevant to the present sample of UCF preservice teachers, which was 88.7% female or third-gender ( $n = 275$ ) and 38.4% non-White and/or Hispanic ( $n = 116$ ), consistent with the population of 1,999 preservice teachers at UCF (O. Smith, personal communication, October 24, 2019).

Many preservice teachers found the investment allocation exercise difficult, seen in the fact that 20% of preservice teachers who participated on paper skipped the exercise; several even wrote question marks around it. This may have stemmed from the fact that it was not adequately explained, given participants lack of knowledge regarding the funds and terminology presented, as well as investing in general. However, this was realistic, because participants would see the same descriptions and a similar fund menu when selecting investments within the FRS investment plan (MyFRS, 2019b). In fact, instead of five options they would have 22, several of which are worse due to having higher management fees. This is not atypical—the fund menus for

other public retirement systems and private employers are typically more confusing and contain less favorable choices, which is a factor, along with behavioral biases, that leads to poor investment outcomes (Benartzi & Thaler, 2002, 2007; Mottola & Utkus, 2009; Richards, 2012).

The FRS menu might be improved by better describing the underlying indices for the three index-tracking funds I included in the exercise, because the “Barclays Capital Aggregate Bond Index,” “Russell 3000 Index,” and “MSCI ACWI ex-U.S. IMI Index” are likely unknown to participants. If it was explained, for instance, that the Russell 3000 has about 80% overlap with the better-known S&P 500 plus the inclusion of smaller corporations, this might benefit investors. It may be helpful to give a brief explanation that the stock index funds invest in the world’s publicly traded corporations in proportion with their valuations and the bond index fund includes corporate and government debts (Bogle, 2009). Moreover, it is evident that participants did not understand the definition of “risk” presented in the fund choices, as they gravitated toward low-risk investments despite their time horizon being 30 years or longer. It would be helpful to explain that over long timespans, the bond and money market funds actually are *riskier*, due to a near-guarantee of suppressed portfolio growth and perhaps even loss of real value due to inflation outpacing returns (Bogle, 2009; Mitchell et al., 2008; Richards, 2012). However, I did not explain this in order to be consistent with the FRS descriptions and other investment providers who do not prominently explain this.

Because of participants’ poor performance, it was difficult to devise rules that would not overwhelmingly classify preservice teachers as choosing “bad” portfolio allocations. Even the rules I devised, which merely required avoiding over-allocating to low-risk, low-return investments due to all of the listed investment choices being fairly good, classified nearly four in five preservice teachers as “bad,” of the ones who provided a valid response at all (71 did not).

Furthermore, 18.2% ( $n = 40$ ) of 220 preservice teachers included in the logistic regression made the  $1/n$  allocation error of simply putting 20% in each of the five listed funds, with is a naïve diversification strategy that produces poor results (Benartzi & Thaler, 2001, 2007). I avoided a classification scheme with three or more categories due to the increased subjectivity inherent in ranking portfolios as such.

### **Summary**

Although the regression on preservice teachers' anticipated career length was not statistically significant in Research Question 4, the logistic regression model in Research Question 5 was statistically significant in its ability to predict good versus bad portfolio allocation ( $p = .034$ ; Nagelkerke  $R^2 = .104$ ). Furthermore, results for Research Question 3, which compared preservice teachers age 18–25 with MTurk participants, consistently showed statistically significantly better performance in the MTurk sample as compared with preservice teachers on a host of financial measures. These measures were based in both perceptions (i.e., familiarity with plans) and actual measures of financial and investment knowledge and sophistication, such as account ownership, portfolio allocation sophistication, and number of correct answers on financial knowledge quiz items. Such corroboration of perceived or self-reported measures is important because Americans frequently over-estimate their financial acumen (FINRA, 2019; Thrupp, 2017). Given these results, there is a strong need for Florida preservice and early-career teachers to become knowledgeable about personal finance, investing, and retirement plans (Joo, 2008).

### **Discussion of Gender and Minority Gaps**

Teachers are predominantly women, particularly when it comes to elementary and early childhood educators which were the primary majors among UCF preservice teachers and the

present sample. As a group, they face a wide range of headwinds toward investing for retirement and achieving and sustaining financial wellness. It is regrettable that the teacher pay gap has widened (Allegretto & Mishel, 2016) *and* the gender pay gap persists even in the 21st century, primarily due to higher-paying jobs going to men (Mandel & Semyonov, 2014). For instance, as many as 82% of superintendents are males (Kim & Brunner, 2009), whereas only 13.4% of UCF preservice teachers are male. In addition, retirement benefits are becoming much less generous, in Florida (MyFRS, 2011) and elsewhere (Backes et al., 2016; Snell, 2012).

Importantly, women work fewer *paid* hours and get paid less for them (Frejka et al., 2018), but in fact may be working as many hours or more than their male counterparts due to a second shift at home. This reduces their retirement contributions and benefits, which directly relate to earnings. For Florida preservice teachers, the implications are not just limited to lower FRS pension benefits or DC contributions and investment returns, but also lower Social Security benefits and less money contributed to discretionary plans such as 403(b)s, 457 plans, IRAs, or even 529 plans and Florida prepaid college plans for their future children. Goldhaber and Grout (2016), for instance, observed that contributing a higher percentage of salary to one's DC plan was correlated with being older and holding an advanced degree among Washington state teachers, meaning that these teachers had the double-benefit of higher salaries *and* contributing a larger percentage to retirement. Indeed, those with lower incomes lack the discretionary income to increase their retirement contributions (Hasler et al., 2018), reinforcing and perpetuating their position of financial disadvantage.

Women typically perform statistically significantly worse than men on financial knowledge quiz items, and this lack of knowledge compounds their disadvantages (Lusardi, Mitchell, & Curto, 2010). Furthermore, women and minorities tend to avoid investment risk

(Farrell, 2009; Lusardi & Mitchell, 2008) which can reduce their DC portfolio value at retirement by as much as 8%. Combining these multifaceted issues with declining teacher retirement benefits makes new teachers especially underprivileged and increasingly unlikely to enjoy financial wellness (Joo, 2008), even in retirement. Therefore, the financial education and empowerment of preservice teachers is of special relevance in terms of both occupational and gender equity. Although teachers tend to be White females, UCF is a Hispanic-serving institution with 27.5% Hispanic-student enrollment (UCF, 2019b), and my sample of preservice teachers was 26.5% Hispanic and 38.4% were either Hispanic and/or not White. This means that UCF preservice teachers may especially benefit from financial education efforts, particularly given their low levels of financial and investment literacy observed in survey responses.

### **Contributions to the Field**

Overall, my survey and results contributed financial and retirement research on preservice teachers to the literature, which presently is lacking (Lucey & Norton, 2011). Because the survey covered areas of financial and retirement knowledge, preferences, perceptions, and challenges, the results offered unusual breadth regarding the financial wellness of Florida preservice teachers (Joo, 2008), which was strengthened when coupled with an analysis of my MTurk comparison sample. In particular, the sections on DB–DC and DB–salary preferences helped fill a gap in the literature identified by Ettema (2011), who stated that “little is known about the actual pension preferences of individual teachers” (p. 36). The results also offered specific insights in relation to the FRS (e.g., the lack of knowledge among preservice teachers), which should be of particular interest given the Florida legislature’s 2018 decision to switch the default option from the pension (DB) plan to the investment (DC) plan (Florida Division of Retirement, 2018). Finally, this dissertation should be taken as a call to action to focus on

preservice teachers' financial wellness, given the consistently low levels of financial capability seen in UCF preservice teachers, who statistically significantly underperformed the comparison MTurk sample on every item pondered under Research Question 3.

### **Limitations**

There were certain limitations common to this type of research, ones that were specific to the sampling frame and implementation, and ones that emerged regarding issues with the survey instrument that could have been identified had pilot testing been used. The lack of evidence concerning reliability and validity of the overall instrument and its components is a notable limitation. In addition, several limitations were related to MTurk procedures. Conducting cognitive interviews to examine how participants parse and understand each item would have been helpful (Willis, 2004). Overall, the large pool of participants and rich data collected tempered these limitations, to an extent.

### **Use of and Generalizability of UCF Preservice Teachers**

Research of undergraduate students is widespread (Gallander Wintre, North, & Sugar, 2001), but this practice is criticized for impeding generalizability due to homogeneity, as well as lack of comparability with the general public that is difficult to model or control for, particularly when it comes to personal or attitudinal variables (Hanel & Vione, 2016). As a limitation, this was partly applicable to my dissertation. However, there was also a specific rationale for selecting undergraduate education majors, which was to understand their knowledge and perspectives on personal finance and retirement. Generalizability to private-sector workers with respect to DB choices, preferences, and knowledge is neither possible nor desired because private-sector workers do not typically work in jobs that offer pension plans, unlike public-sector workers (Hansen, 2010). Moreover, Florida preservice teachers were specifically relevant

because they are more likely to go on to work in Florida than preservice teachers going to college in other states,<sup>36</sup> and if so they will be given a choice between a DB and DC employer-sponsored retirement plan. Choosing appropriately requires financial and program-specific knowledge, as well as foresight. This dissertation helped shed light on Florida preservice teachers' lack of knowledge, which may justify increasing the priority of and funding for educational initiatives. Studying UCF preservice teachers over other Florida institutions was appropriate given that UCF is the largest public university in the United States with a broad and diverse enrollment (UCF, 2016, 2019a, 2019b), although future research studying preservice teachers at other Florida colleges and universities is recommended.

### **Volunteer Biases**

In survey research, response or volunteer bias may occur, where respondents who elect to participate differ on important characteristics from the target population as a whole (Rosnow & Rosenthal, 1976). However, my use of in-person visits induced participation from the majority of attending students, which was far superior to email solicitation (Fink, 2016). I also collected most of my data near the beginning of the Summer B and Fall 2019 semesters, when attendance tends to be higher (Credé, Roch, & Kieszczynka, 2010), and the earliest data was collected at the end of Summer A courses that tended to have high attendance due to final projects and presentations. Regarding the MTurk sample, Turkers have been found to be useful as a comparison group (Azzam & Jacobson, 2013) and representative overall (Buhrmester et al., 2011), which diminished the risk of volunteer bias.

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<sup>36</sup> They are also typically required to pass Florida teacher certification exams in order to graduate, which further incentivizes teaching in Florida; these exams cost \$130 or more and do not transfer to other states.



My approach to soliciting instructors was not systematic, which suggests the possibility that the courses and/or students of instructors who agreed differed from those who declined or did not respond to my emails. However, the large percentage of elementary and early childhood education students in my sample (79.4%) was consistent with UCF's population of 1,994 preservice teachers (71.2%; UCF, 2019c), as were my sample's proportions of females (87.7% vs. 86.6% in the population), upper-level students (89.9% vs. 85.4% in the population), and minorities (38.4% vs. 42.2% in the population of UCF preservice teachers combined with graduate students; O. Smith, personal communication, October 24, 2019). This provides evidence that my sample was representative of the population of preservice teachers at UCF.

### **Classification of Portfolio Allocations**

Limitations related to classifying portfolio allocations as good versus bad were also discussed in prior sections. A principal concern is that the goal of sorting participants into those who are more sophisticated at investing (i.e., more likely to make wise investment choices) versus those who are not might be better achieved with a different approach, or even by different means such as Fitzpatrick's (2015) approach to determining how much value teachers place on future retirement benefits. This limitation might be addressed by future researchers.

### **Layout and Response Issues**

One notable layout issue was that on the multi-part concerns about debt item (Q38; Appendix A), the "I do not currently have this debt" column should have been placed on the left instead of the right. There were several paper participants who checked a different box and then scratched it out to check this box, implying that they did not notice this column at first. Other participants may have overlooked this column entirely, resulting in inaccurate data. Another notable response issue was that not asking for open-ended elaboration on the neutral choice on

the DB–salary preference (Q11) and vesting (Q14) items resulted in several paper participants scratching out their answer and changing it to the neutral item in order to avoid answering the open-ended request for elaboration, and such behavior may also have occurred in Qualtrics. (Open-ended responses were not analyzed in this dissertation but will appear in future articles.) Also, 50 paper participants did not give a point estimate for anticipated teaching career length or retirement age, instead using ranges, plus signs, inequality signs, et cetera. Clarifying the prompt and using a number line or two blank boxes for entry of no more than a two-digit number would discourage this. Another limitation is that certain items and functionalities could not be replicated on paper, so the two versions of the preservice teacher instrument differed. However, this is ameliorated by the fact that only 13.7% of preservice teachers participated via Qualtrics.

### **MTurk Issues**

Data collection on the MTurk platform presented several unforeseen challenges and potential limitations. Firstly, although I prominently stated the delimitations on age and college status when soliciting MTurk participants, this was enforced with screening questions answered on the honor system. A better but more complex methodology would be to pay Turkers a nominal fee (e.g., 3¢) for a brief screening survey that asks them their age and educational attainment, and perhaps gender too, if a quota is desired to increase the percentage of females, and then invite qualified respondents to complete the full survey. Secondly, consistent with Buhrmester’s (2018) methodology I re-posted the request with a sample size of nine each time to reduce Amazon’s commission from 40% to 20%. Although this had a secondary benefit of moving the task to the top of the list so that more potential participants saw it, I had to screen Amazon Worker ID numbers to remove 10 duplicate submissions, despite warning participants in several places that only one submission would be accepted (cf. Peer et al., 2014). Thirdly, a

subset of participants rushed through the survey, with 70 (34.1%) completing it in under five minutes and 13 (6.3%) in under three minutes. I refrained from including attention-check items on Peer et al.'s (2014) recommendation that restricting participants to those who have completed many prior tasks with a high acceptance rate (i.e., 98% and more than 500 tasks) is sufficient, but it may have been warranted to include at least one such item as recommended by Rouse (2015). Nevertheless, overall it was clear that most Turkers put a great deal of effort into providing detailed and complete responses, consistent with prior research (e.g., Buhrmester et al., 2011; Casler et al., 2013; Rouse, 2015).

### **Implications and Policy Recommendations**

Given the low level of financial knowledge observed among preservice teachers, it would be prudent to warn new teachers about making potentially unfavorable changes to their portfolio (Benartzi & Thaler, 2002; Thaler, 2013). Although the FRS default is now a DC plan invested 100% into a target-date retirement fund, new teachers who take the effort to make a change may end up worse off if their fund selection choices mirror what was observed in the present research (i.e., overweighting toward bonds and low-risk money market funds; Mitchell et al., 2008). Retirement plans outside the FRS, such as 403(b) plans that are marketed to teachers by outside providers, should be tightly regulated and policed to prevent the peddling of suboptimal financial vehicles such as variable or fee-laden annuities, whole life insurance, or predatory investment funds (e.g., ones that collect high fees and are no better than the index funds featured in Figure 3; see Bogle, 2009). This could be accomplished through watchdog groups established governmentally at state and federal levels, as well as by non-profit institutions (Willis, 2009). However, the influence and danger of lobbying by vested interests cannot be understated, who may subvert these very structures, ostensibly to promote consumer freedom and empower

consumer choice, but in actuality to line their pockets by selling deleterious financial products that exploit the financially unknowledgeable (Clark & Richardson, 2010; Mercado, 2018).

New teachers need competent investing education, free of conflicts of interest, given that only 24% of surveyed UCF preservice teachers knew that “buying a single company stock usually provides a safer return than a stock mutual fund” (Q22; Appendix A; Lusardi & Mitchell, 2008). For new Florida teachers, this could be accomplished by higher funding and further outreach from the FRS (e.g., MyFRS, 2019a) regarding their free financial planning services and educational webinars. For educational initiatives to be effective, they must be strategic in timing, scope, and methods. Brief, intensive workshops may be more effective than lengthy courses (Harter & Harter, 2012), and education applied at the right time (Fernandes et al., 2014), such as during the first months of employment when new Florida teachers face several retirement-related decisions (MyFRS, 2019a), is more effective. However, the need for financial education to be integrated throughout the K–12 curricula, rather than relegated to an elective high school or college course, cannot be understated (Council for Economic Education, 2018; Jump\$tart, 2015). “Nudges,” such as retirement plan participants automatically being placed in sensible investments and having their contributions silently increased each year or with each pay raise (Thaler & Benartzi, 2004; Thaler & Sunstein, 2008), are also of critical importance to promoting financial wellness and may be enhanced when coupled with financial education. Presently, FRS investment plan participants are automatically placed in a retirement target-date fund matched with their age, but there is no way to increase one’s contribution percentage to the FRS investment plan beyond 3.0% of salary (MyFRS, 2019a).

## **Recommendations for Further Research**

The lack of financial and investing knowledge seen among Florida preservice teachers, most of which in this study were within two years of becoming teachers (90% juniors or seniors), could also impede the financial education of their future students, even at the Pre-K–5 grade levels (McKenzie, 1971; McKinney et al., 1990). Further research would be helpful to investigate if this is the case, and to examine whether workshops or other financial education interventions (e.g., Harter & Harter, 2012) for pre- and or in-service teachers have an impact on student financial knowledge, to replicate and extend past findings which are now dated (i.e., from the 1990s and earlier). This is consistent with the JumpStart’s (2015) recommendation that financial education should start in the elementary grades in order to be optimally effective. Longitudinal research that follows preservice teachers into their teaching careers to see how their financial knowledge and perceptions change is also recommended. Studying preservice teachers at other Florida colleges and universities may also be warranted (e.g., South Florida may yield different results due to demographic differences).

Regarding the survey’s portfolio allocation exercise, it may be useful to amend this to include ill-advised, high-risk options such as cryptocurrencies, marijuana stocks, or sector-specific funds (e.g., health, technology, utilities) in addition to whole-market index funds. This would reveal whether participants are drawn to these eye-catching but deleterious investments instead of the low-risk money market and bond funds (Dimmock et al., 2018), and classifying portfolios as good or bad would also become easier and perhaps more statistically powerful.

Further research could triangulate or corroborate findings with one-on-one interviews or focus groups, which would reveal more about preservice teachers’ financial knowledge and concerns. When combined with cognitive interviews of participants as they complete the survey

(Willis, 2004), this would also suggest modifications to the survey. Extending the population of interest to include early-career teachers and beyond is also recommended. Even as individuals reach middle age and approach retirement, their financial, investing, and retirement knowledge does not necessarily improve (e.g., Choi et al., 2011).

Another area for further research would be to explore preservice teachers' past financial education experiences. Regarding potential survey items to address this, Carly Urban, an economics professor who studies the impacts of financial education in high schools and other settings (e.g., Urban, Schmeiser, Collins, & Brown, 2018), suggested that I ask whether participants made sacrifices to pursue their financial education (e.g., chose it over another class or gave up free time), and where they attended high school (C. Urban, personal communication, June 10, 2019). Then, it would be possible to correlate results with poverty rates and whether financial education courses were offered at individual high schools. Although I included two items about financial education on the survey (the responses for which were qualitative and not analyzed in this dissertation), they did not go into such depth. Asking such questions might be a useful avenue to explore in future research of preservice teachers or other populations.

### **Conclusion**

The survey results have provided insights into the knowledge, concerns, and preferences of Florida preservice teachers regarding retirement and finance. The results have also facilitated comparisons via a novel methodology that incorporated MTurk participants of similar age and education, as well as by incorporating survey items from past research (i.e., Lucey & Norton, 2011; Lusardi & Mitchell, 2008; Peng et al., 2007) to see how UCF preservice teachers perform. By use of paper surveys and in-class visits, the majority of students attending each class participated, which is preferable to the low response rates often seen in mass email solicitations

(e.g., 5% in Lucey & Norton, 2011; Lucey & Henning, 2018). Participants were overwhelmingly junior and senior female Pre-K–5 preservice teachers, who are soon to become teachers and will be able to choose between a DB and DC plan if teaching in Florida. Primary policy implications were that financial education needs to be emphasized for preservice teachers, which may benefit not only them but also their future students (Harter & Harter, 2012; Swinton et al., 2010), and that retirement contributions rates and investments should be structured to automatically increase over time and to discourage selection of investments that are inappropriate for teachers' retirement time horizon (e.g., Thaler & Benartzi, 2004).

My development of a new survey instrument (Appendix A) addressed a gap in the literature, and also provided evidence of the internal-consistency reliability of Lucey and Norton's (2011) retirement challenges and expectations subscale while suggesting two new subscales for retirement plan familiarity and concerns about debt that demonstrated internal consistency ( $\alpha > .75$  in all cases). The data I collected was rich and detailed with missing data primarily being a problem only for the portfolio allocation exercise, which was confusing and difficult for preservice teachers. Overall, I was unable to do full justice to the dataset in this dissertation and plan to write follow-up articles that explore the data from different angles, including an analysis of qualitative open-ended responses. I also hope that other researchers will use and adapt the survey instrument for further research in this area and I encourage interested parties to contact me. This dissertation serves as evidence that financial education needs to be prioritized, but also that financial products are confusing and should be simplified and better-regulated so that consumers' best interests are put first (Pinto, 2013; Remund, 2010; Ross & Squires, 2011), including the interests of teachers to promote financial wellness throughout their careers and in retirement.

**APPENDIX A: SURVEY INSTRUMENT, PRESERVICE TEACHERS (PAPER)**



You may take this survey on paper, or on your computer, tablet, or smartphone by visiting: [www.tinyurl.com/ucfptrs](http://www.tinyurl.com/ucfptrs). **Please take the survey only one time.**

### **EXPLANATION OF RESEARCH**

**Title of Project:** A Survey of Investing and Retirement Knowledge and Preferences of Florida Preservice Teachers

**Principal Investigator:** Richard Thripp, M.A.

**Faculty Supervisor:** Richard Hartshorne, Ph.D.

You are being invited to take part in a research study. Your participation is voluntary, but is of critical importance to the outcomes of the study.

- This research study focuses on knowledge and perceptions of retirement plans and financial challenges among preservice teachers in Florida.
- This is an anonymous survey with 39 items. This includes several demographic questions we would like you to answer. No names or student/school records will be used.
- Some of the questions you will be asked in this survey measure your opinions, and others measure your knowledge. After submitting the survey, you will be shown the correct answers for the knowledge questions along with explanations.
- Participation in this study will require approximately 15 minutes of your time.

You must be **18 years of age or older** to take part in this research study. Your participation in this study is voluntary. You are free to withdraw your consent and discontinue participation in this study at any time without prejudice or penalty. Your decision to participate or not participate in this study will in no way affect your relationship with UCF, including continued enrollment, grades, employment or your relationship with the individuals who may have an interest in this study.

**Study contacts for questions about the study or to report a problem:** If you have questions, concerns, or complaints: Richard Thripp, Graduate Student, Instructional Design & Technology Program, College of Community Innovation and Education by telephone at [removed] or by email at [removed]; or Dr. Richard Hartshorne, Faculty Supervisor by telephone at [removed] or by email at [removed].

**IRB contact about your rights in this study or to report a complaint:** If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or by email at [irb@ucf.edu](mailto:irb@ucf.edu).

I AGREE to participate in this study

I DO NOT AGREE to participate in this study → STOP here.

**Please start on the next page →**

**START HERE:**

1. Do you plan to become a teacher? (Please circle.)
  - a. Yes
  - b. No → GO TO Item 4.
  - c. Maybe
  - d. I am already a teacher
  
2. How many total years do you expect to work as a teacher? If you are currently teaching or have taught in the past, please include those years in your estimate. Please answer in whole numbers only (e.g., 20). \_\_\_\_\_
  
3. Regarding your decision to become a teacher, how important are/were retirement benefits in choosing this profession? (Please circle only one.)
  - a. Unimportant
  - b. Of little importance
  - c. Moderately important
  - d. Important
  - e. Very important
  
4. At what age do you expect to retire from paid employment (teaching or otherwise)? Please answer in whole numbers only (e.g., 65). \_\_\_\_\_
  
5. How familiar are you with the following types of retirement plans? (Please mark only one box for each type of plan.)

Type of plan	Not at all familiar	Slightly familiar	Somewhat familiar	Moderately familiar	Extremely familiar
Employer-sponsored retirement plans (e.g., 401[k], 403[b], 457)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Florida Retirement System investment plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Florida Retirement System pension plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Individual retirement arrangement (IRA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Please continue on the next page →**

**CONTINUE HERE:**

6. Do you have any of the following types of accounts/plans? (Please mark all that apply.)

- Brokerage account (e.g., Fidelity, Schwab, Vanguard)
- Checking and/or savings account
- Employer-sponsored retirement plan (e.g., 401[k], 403[b], or 457)
- Florida Retirement System plan
- Individual retirement arrangement (IRA)
- Prefer not to say

7. Have you ever participated in any type of financial education, such as a school activity (e.g., mock investing in stocks), high school or college course, workshop, debt counseling, online learning module, or online course (e.g., Better Money Habits)?

- a. Yes (Please Describe) \_\_\_\_\_
- b. No → GO TO Item 9.

8. You indicated that you have previously participated in financial education. Are there any specific ways in which this education benefited you?

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9. If offered a choice between the following two types of retirement plans, which one would you choose? (Please circle only one.)

- a. A defined-benefit pension plan where you do not need to make any investment decisions. Your pension is based on pay grade and years of service.
- b. Selecting and managing your own investments in a defined-contribution retirement account such as a 401(k).

10. Most U.S. states offer teacher pension plans, in which teachers typically must work in that state for a minimum 5–10 year vesting period before they can receive a minimum pension at retirement age. **Were you aware of this?**

- a. Yes
- b. No

**Please continue on the next page →**

**CONTINUE HERE:**

11. If given the choice between a **pension plan** or a **salary increase of equivalent value**, which would you prefer? (Please circle only one.)

- a. Strongly prefer pension plan
- b. Somewhat prefer pension plan
- c. Neither option preferred → GO TO Item 14.
- d. Somewhat prefer salary increase of equivalent value → GO TO Item 13.
- e. Strongly prefer salary increase of equivalent value → GO TO Item 13.

12. You indicated that you would strongly or somewhat prefer a **pension plan** rather than a salary increase of equivalent value. Please explain why you feel this way.

\_\_\_\_\_ → GO TO Item 14.

13. You indicated that you would strongly or somewhat prefer a **salary increase of equivalent value** rather than a pension plan. Please explain why you feel this way.

14. Florida has an **8-year vesting period** for teachers enrolling in the Florida Retirement System pension plan, which means that you will not receive your pension unless you are employed in the Florida system for at least 8 years. How concerned would you be about **not** meeting the vesting requirement (e.g., due to moving to another state or changing professions)?

- a. Not at all concerned
- b. Slightly concerned
- c. Somewhat concerned → GO TO Item 17.
- d. Moderately concerned → GO TO Item 16.
- e. Extremely concerned → GO TO Item 16.

15. You indicated that you would be **not at all** or **slightly concerned** about meeting the vesting requirement. Please explain why you feel this way.

\_\_\_\_\_ → GO TO Item 17.

16. You indicated that you would be **moderately** or **extremely concerned** about meeting the vesting requirement. Please explain why you feel this way.

17. The Florida Retirement System offers teachers a choice between a pension plan and an investment plan similar to a 401(k). **Were you aware of this?**

- a. Yes
- b. No

**Please continue on the next page →**

**CONTINUE HERE:**

18. Florida schools and teachers pay Social Security tax and can expect to receive Social Security benefits, in addition to their Florida Retirement System benefits. **Were you aware of this?**
- a. Yes
  - b. No
19. The Florida Retirement System offers an educational website about retirement planning ([www.myfrs.com](http://www.myfrs.com)). **Were you aware of this?**
- a. Yes
  - b. No
20. The Florida Retirement System offers a free financial guidance hotline staffed with financial planners who can review your account and provide advice on retirement planning (866-446-9377). **Were you aware of this?**
- a. Yes
  - b. No
21. Over the last 30 years in the United States, the best average returns have been generated by which one of the following?
- a. Bonds
  - b. Certificates of deposit (CDs)
  - c. Money market accounts
  - d. Precious metals
  - e. Stocks
  - f. Don't know
22. Do you think the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund.
- a. True
  - b. False
  - c. Don't know
23. Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow?
- a. More than \$102
  - b. Exactly \$102
  - c. Less than \$102
  - d. Don't know

**Please continue on the next page →**

**CONTINUE HERE:**

24. Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy...
- a. More than today
  - b. Exactly the same as today
  - c. Less than today
  - d. Don't know

25. Assume you are participating in the Florida Retirement System investment plan, a defined-contribution retirement account similar to a 401(k) plan. Three percent of your salary comes out of each paycheck and gets deposited in investment(s) of your choice from the following list. **Please indicate the percentage of contributions that you would contribute to each fund.** You can put 100% in one fund, or divide contributions between funds as you see fit.

**FRS Money Market Fund**

*Risk: Very low* \_\_\_\_\_%

*Management fee: 0.06% per year*

The Fund seeks as high a level of current income as is consistent with liquidity and stability of principal.

**FRS U.S. Bond Enhanced Index Fund**

*Risk: Low* \_\_\_\_\_%

*Management fee: 0.05% per year*

The Fund seeks to achieve or modestly exceed the total return of the Barclays Capital Aggregate Bond Index.

**FRS Retirement Fund (2060)**

*Risk: Aggressive* \_\_\_\_\_%

*Management fee: 0.11% per year*

This fund favors stocks over bonds. It is best suited for FRS members who have between 45 and 50 years before reaching their FRS normal retirement age or before they retire and begin taking distributions.

**FRS U.S. Stock Market Index Fund**

*Risk: Aggressive* \_\_\_\_\_%

*Management fee: 0.02% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of its Underlying Index. The Underlying Index is the Russell 3000 Index.

**FRS Foreign Stock Index Fund**

*Risk: Aggressive* \_\_\_\_\_%

*Management fee: 0.03% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of the MSCI ACWI ex-U.S. IMI Index.

**Please double-check that your total sums to 100%.**

**Please continue on the next page →**

**CONTINUE HERE:**

26–31. For each of the following statements related to retirement, indicate the extent to which you agree or disagree. (Please mark only one box for each statement.)

Statement	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I expect that I will have to work during retirement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student loan repayments will prevent me from funding my retirement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Credit cards repayments will prevent me from funding my retirement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I want to save for retirement, but don't think my salary will be enough to afford it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I want to save for retirement, but don't think I can afford to invest beyond what I will contribute to employer's retirement plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I do not need to save as much for retirement because my spouse will save enough for both of us.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32. What is your gender? (Please circle.)

- a. Female
- b. Male
- c. Non-binary / Third gender
- d. Prefer to self-describe \_\_\_\_\_
- e. Prefer not to say

33. What is your age? \_\_\_\_\_ (Please respond in years, such as 24.)

**Please continue on the next page →**

**CONTINUE HERE:**

34. Are you of Hispanic, Latino, or Spanish origin? (Please mark all that apply.)

- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, another Hispanic, Latino, or Spanish origin \_\_\_\_\_
- Prefer not to say

35. Which of the following best describes your race or ethnicity? (Please mark all that apply.)

- White
- Black or African American
- American Indian or Alaska Native \_\_\_\_\_
- Asian Indian
- Chinese
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian \_\_\_\_\_
- Native Hawaiian
- Guamanian or Chamorro
- Samoan
- Other Pacific Islander \_\_\_\_\_
- Some other race \_\_\_\_\_
- Prefer not to say

36. What is your current major (or intended major)?

- a. Elementary Education
- b. Early Childhood Development and Education
- c. Secondary Education
- d. Social Science Education
- e. English Language Arts Education
- f. Teacher Education
- g. Exceptional Education
- h. Mathematics Education
- i. Art Education
- j. Technical Education and Industry Training
- k. Science Education
- l. Other or Dual Major (Please Specify) \_\_\_\_\_

**Please continue on the next page →**



**CONTINUE HERE:**

37. What is your academic class standing?

- a. Freshman (0–29 credit hours completed)
- b. Sophomore (30–59 credit hours completed)
- c. Junior (60–89 credit hours completed)
- d. Senior (90–120+ credit hours completed)
- e. Other (Please Specify) \_\_\_\_\_

38. Regarding your financial situation, how concerned are you about the following types of debt?  
(Please mark only one box for each type of debt.)

Type of debt	Not at all concerned	Slightly concerned	Somewhat concerned	Moderately concerned	Extremely concerned	I do not currently have this type of debt
Auto loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Credit cards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loans from family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mortgage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student loans	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

39. **\*\* Thank you for your time completing this survey. \*\*** Please use the area below for any comments or feedback. Please indicate if any items were difficult or confusing.

[No one specifically asked for it, but I offered the answer sheet to interested participants upon conclusion of data collection at the majority of my classroom visits, and gave away a total of approximately 40 copies. In Qualtrics, these answers were shown automatically upon submission of the survey, but I did not include the answers in the paper version to prevent cheating.]

Thank you for your participation.

***For reference, here are the correct answers to the knowledge items that were included in this survey.***

Over the last 30 years in the United States, the best average returns have been generated by which one of the following? **Stocks**

Do you think the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund. **False. Individual stocks are more risky, while mutual funds contain multiple stocks which reduces risk via diversification.**

Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? **More than \$102, because the balance increases by 2% each year. The final balance would be about \$110.41.**

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, with the money in this account, would you be able to buy... **Less than today, because prices have increased by 2% while your account balance has only increased by 1%. This means that your real purchasing power has declined, despite the fact that your nominal account balance has increased.**

***Regarding the portfolio-building exercise:***

Assume you are participating in the Florida Retirement System investment plan, a defined-contribution retirement account similar to a 401(k) plan. Three percent of your salary comes out of each paycheck and gets deposited in investments of your choice from the following list. Please indicate the percentage of contributions that you would contribute to each fund. The total must sum to 100%. **In this exercise, only 5 of 22 FRS funds were shown for brevity. Because target-date funds adjust risk over time, if the 2060 target-date fund is chosen, 100% of contributions should go into that fund. Otherwise, using a combination of the other three funds except the money market fund is appropriate. Note that if you are in your 20s or 30s, it is reasonable to invest only in stocks, avoiding bonds due to your time horizon being several decades. As you age, it is suggested to decrease exposure to stocks to reduce risk. The money market fund is generally ill-advised as it will produce depressed returns over long timeframes. Note that management fees were not a concern with any of the displayed funds.**

## **APPENDIX B: DIFFERENCES BETWEEN PAPER AND QUALTRICS SURVEYS**

This appendix explains and details the differences between the preservice teacher paper survey depicted in Appendix A ( $n = 271$ ), and the Qualtrics versions of the survey solicited to preservice teachers ( $n = 43$ ) and MTurk participants ( $N = 205$ ). The preservice Qualtrics survey was designed to be as similar as possible to the paper version. The MTurk Qualtrics survey added screening questions to restrict this sample to college students/graduates ages 18–25 and removed items pertaining to the FRS, academic year, and academic rank. Although screenshots are only included for certain sections of the Qualtrics surveys, please contact me if you are interested in further information (e.g., @richardxthripp on Twitter).

The Informed Consent section for the preservice Qualtrics survey was worded almost identically to the paper version, except for the addition of this paragraph (in the August 26, 2019 revision; see Appendix E) regarding extra credit for my EME 2040 students:

If you are a student in **EME 2040: Introduction to Technology for Educators** (Fall 2019, Sections 0W61 or 0W62), you will receive 10 extra credit points for completing this survey. In order to receive your extra credit, note that on the last page of the survey before submission, a **unique five-digit completion code** will be displayed in large font which you must record and enter in the extra credit assignment submission area in the EME 2040 Webcourse. Alternately, if you do not wish to take this survey you may complete two "Challenges of the Week" extra credit items in the Webcourse for 10 extra credit points. Please do not re-take the survey if you completed it previously (i.e., Mr. Thripp visited one of your courses in the Summer 2019 semester and collected a survey response from you).

Qualtrics participants clicked a yellow arrow button to proceed instead of being asked to check a box agreeing to participate in the study. The Qualtrics surveys used Arial font throughout instead of Times New Roman. The Qualtrics surveys were described as “confidential” instead of “anonymous” due to potentially identifiable data being collected by way of completion codes.

The Informed Consent section for the MTurk survey added the line “**You must be between ages 18–25 and a college student or college graduate to participate**” in bold as the

first bullet point. The title was truncated to “A Survey of Investing and Retirement Knowledge and Preferences” (i.e., “of Florida Preservice Teachers” was removed). The survey was described as “a confidential survey with 35 items” due to removal of four FRS items, and was said to “require approximately 10 minutes” instead of 15. Finally, the following two paragraphs were added, pertaining to qualification criteria and submission procedures:

Thank you for agreeing to participate in our research. Before you begin, please note that the data you provide may be collected and used by Amazon as per its privacy agreement. This agreement shall be interpreted according to United States law.

You will earn **\$1.00** (U.S. dollar) for completing this survey, which will be added to your Amazon Mechanical Turk worker account balance within three days of completion. In order to receive your payment, note that on the last page of the survey before submission, a **unique five-digit completion code** will be displayed in large font which you must record and enter on Amazon Mechanical Turk. **Secondly, note that even if this survey solicitation is re-posted, you may only complete it one time. Any repeat submissions will not be compensated.** Thirdly, you must meet the criteria to be compensated (college student or graduate ages 18–25). Finally, submissions where less than 75% of items are answered or where the survey was completed in less than three minutes will not be compensated. However, it is perfectly fine, where applicable, to answer "Don't know" or "Prefer not to say" to any items.

The MTurk solicitation (task posting and description) has been detailed in the Methodology chapter. MTurk participants were first asked with a slider ranging from 18 to 25, and whether they are currently a college student, as depicted below.

What is your age? (You must be 18–25 to participate.)

18      19      20      21      22      23      24      25

Age



Are you currently a college student? (For example, enrolled in a vocational or technical certificate program, community college, or college/university.)

Yes

No



Participants were not allowed to proceed unless they answered the above two questions and the question below, if applicable (the text “Please answer this question” was displayed). Those who were not current college students were asked if they graduated in the past. If selecting “No,” they were disqualified and sent to the answer page for the survey (depicted on the last page of Appendix A) without receiving a completion code.

Are you a college graduate? (For example, you have earned a certificate from a vocational school or a degree from a community college or college/university.)

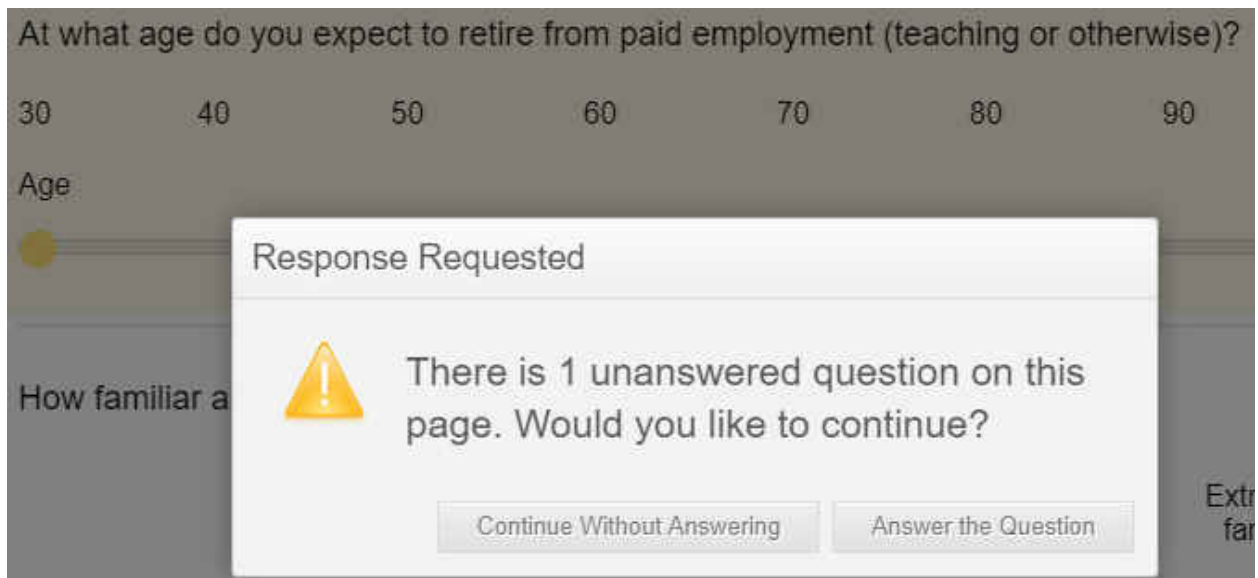
Yes

No



Q2 which asked about anticipated teaching career length used a slider ranging from 0–70 years in the Qualtrics versions, instead of a blank. Q4 asking about expected retirement age used a slider ranging from 30–100 years. Requests for qualitative elaboration that depended on a prior question (Q8, Q12, Q13, Q15, and Q16 in the paper version; Appendix A) appeared dynamically when applicable (qualitative responses were not analyzed in this dissertation). In Qualtrics, a slider ranging from 18–98 was used for Q33 asking preservice teachers their age, instead of a blank. Q5, regarding familiarity with retirement plans, omitted the two FRS plans in the MTurk version. The vesting concern Likert item (Q14) was prefaced with “Imagine you are about to become a teacher in Florida” in the MTurk version. Instead of circling lettered choices, participants were asked to click radio buttons throughout the Qualtrics instruments.

The only items that had prompts if not answered were the MTurk screening questions (mandatory), the portfolio allocation exercise (Q25; mandatory to sum to 100%), the retirement age item (Q4; voluntary), and age of preservice teachers (Q33; voluntary). Participants were not prompted to answer any other items they elected to skip. Voluntary prompts looked like this:



The portfolio allocation exercise (Q25) was mandatory for all Qualtrics participants. The “Please double-check that your total sums to 100%” checkbox was replaced with a box that dynamically displayed the total percentage, and each blank was replaced with a box for participants to type in a percentage. As depicted below, if a participant attempted to skip this item or their allocations did not sum to 100%, they were prevented from proceeding with an error message, “Please total the choices to 100.” This was accomplished using the “Validation” function in Qualtrics set to a “Must Total” value of 100. There was not an option within Qualtrics to make this voluntary.



Please total the choices to 100.

Assume you are participating in the Florida Retirement System investment plan, a defined-contribution retirement account similar to a 401(k) plan. Three percent of your salary comes out of each paycheck and gets deposited in investment(s) of your choice from the following list. Please indicate the percentage of contributions that you would contribute to each fund. You can put 100% in one fund, or divide contributions between funds as you see fit.

**FRS Money Market Fund**

*Risk: Very low*

*Management fee: 0.06% per year*

The Fund seeks as high a level of current income as is consistent with liquidity and stability of principal.

**FRS U.S. Bond Enhanced Index Fund**

*Risk: Low*

*Management fee: 0.05% per year*

The Fund seeks to achieve or modestly exceed the total return of the Barclays Capital Aggregate Bond Index.

**FRS Retirement Fund (2060)**

*Risk: Aggressive*

*Management fee: 0.11% per year*

This fund favors stocks over bonds. It is best suited for FRS members who have between 45 and 50 years before reaching their FRS normal retirement age or before they retire and begin taking distributions.

**FRS U.S. Stock Market Index Fund**

*Risk: Aggressive*

*Management fee: 0.02% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of its Underlying Index. The Underlying Index is the Russell 3000 Index.

**FRS Foreign Stock Index Fund**

*Risk: Aggressive*

*Management fee: 0.03% per year*

The Fund seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of the MSCI ACWI ex-U.S. IMI Index.

Total



Lastly, at the bottom of the final page before submission of the survey, participants were shown a unique, random five-digit code that I directed Qualtrics to store with their response. They were asked to enter this code within the MTurk website or within the EME 2040 online assignment submission area to receive extra credit for completing the survey. In both cases, I used these codes to verify submissions for the purpose of awarding payment (MTurk) or extra credit (preservice EME 2040 students).

**For EME 2040 students only: Here is your completion code to enter into the EME 2040 Webcourse for 10 extra credit points.**

30083

Please record this number and submit it in the EME 2040 extra credit assignment submission area. Then, click the next button to submit your survey.



**Here is your completion code to enter into Amazon Mechanical Turk.**

73271

Please copy and paste this value to Amazon Mechanical Turk. Then, click the next button to submit your survey.



## **APPENDIX C: ONLINE INVITATIONS TO PRESERVICE TEACHERS**

There were two versions of the invitation announcement for online students. The first version, shown below, was sent only to students of one course, SSE 3312: Teaching Social Science in the Elementary School, by the course's instructor in Fall 2019. This was a mixed-mode course, but the instructor did not have sufficient lecture time to afford an in-class visit. Although there were 24 students in the course, only two submissions were received.

Dear Future Educator,

I would like to invite you to share your voice, opinions, and knowledge as a future teacher on teacher pension plans and retirement investing. Would you give me 15 minutes of your time to answer a survey? Your participation will inform financial education research for future teachers and students. Your responses will not be shared with anyone, and only aggregate results will be reported. To participate, please click on this link: [https://ucf.qualtrics.com/jfe/form/SV\\_efdXppkVowwvI2h](https://ucf.qualtrics.com/jfe/form/SV_efdXppkVowwvI2h)

With appreciation,  
Richard Thripp, Doctoral Candidate  
Instructional Design & Technology  
Email: [removed]

The second version explained the EME 2040 extra credit opportunity, as required by the Institutional Review Board. I sent this invitation via course announcement to my EME 2040 students in Fall 2019, which yielded 31 online responses. An additional 11 of my students completed the paper version in other classes out of a total enrollment of 49.

Dear Future Educator,

I would like to invite you to share your voice, opinions, and knowledge as a future teacher on teacher pension plans and retirement investing. Would you give me 15 minutes of your time to answer a survey? Your participation will inform financial education research for future teachers and students. Your responses will not be shared with anyone, and only aggregate results will be reported. To participate, please click on this link: [https://ucf.qualtrics.com/jfe/form/SV\\_efdXppkVowwvI2h](https://ucf.qualtrics.com/jfe/form/SV_efdXppkVowwvI2h)

Please note the following information regarding the extra credit opportunity: If you are a student in **EME 2040: Introduction to Technology for Educators** (Fall 2019, Sections 0W61 or 0W62), you will receive 10 extra credit points for completing this survey. In order to receive your extra credit, note that on the last page of the survey before submission, a **unique five-digit completion code** will be displayed in large font which you must record and enter in the extra credit assignment submission area in the EME 2040 Webcourse. Alternately, if you do not wish to take this survey you may complete two "Challenges of the Week" extra credit items in the Webcourse for 10 extra credit points. Please do not re-take the survey if you completed it previously (i.e., Mr. Thripp visited one of your courses in the Summer 2019 semester and collected a survey response from you).

With appreciation,  
Richard Thripp, Instructor of EME 2040  
Email: [removed]

**APPENDIX D: PERMISSION TO USE LUCEY AND NORTON (2011) ITEMS**

## Re: Question on Survey of Students' Retirement Understandings and Expectations instrument

Lucey, Tom [REDACTED]

Thu 2/21/2019 11:20 AM

Archive

To: Richard Thripp [REDACTED]

Cc: Norton, Edgar [REDACTED]

Hi Richard,

That's perfectly fine. We appreciate your thinking of us. Good luck with your study.

Tom Lucey

---

**From:** Richard Thripp [REDACTED]

**Sent:** Thursday, February 21, 2019 12:54 AM

**To:** Lucey, Tom

**Cc:** Norton, Edgar

**Subject:** Re: Question on Survey of Students' Retirement Understandings and Expectations instrument

Hi Drs. Lucey and Norton,

Thank you for sending that over! I am interested in using your challenges subscale in my survey:

Item 27: I expect that I will have to work during retirement

Item 28: Student loan repayments will prevent me from funding a healthy retirement

Item 29: Credit cards repayments will prevent me from funding a healthy retirement

Item 30: I want to save for retirement, but don't think my salary will be enough to afford it

Item 31: I want to save for retirement, but don't think I can afford to invest beyond what I will contribute to employer's retirement plan

Item 32: I do not need to save as much for retirement because my spouse will save enough for both of us

Please let me know if that would be alright. I will of course cite and credit you. I will use the same five-point Likert scale but change the middle item from Neutral to Neither Agree nor Disagree.

Thanks,

**Richard Thripp**

---

**APPENDIX E: INSTITUTIONAL REVIEW BOARD APPROVALS**





UNIVERSITY OF CENTRAL FLORIDA

**Institutional Review Board**

FWA00000351  
IRB00001138  
Office of Research  
12201 Research Parkway  
Orlando, FL 32826-3246

**EXEMPTION DETERMINATION**

June 14, 2019

Dear Richard Thripp:

On 6/14/2019, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Category 2
Title:	A Survey of Investing and Retirement Knowledge and Preferences of Florida Preservice Teachers
Investigator:	Richard Thripp
IRB ID:	STUDY00000603
Funding:	None
Grant ID:	None

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or [irb@ucf.edu](mailto:irb@ucf.edu). Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Racine Jacques, Ph.D.  
Designated Reviewer

This modification was sought and granted to offer extra credit to my EME 2040 students:



UNIVERSITY OF CENTRAL FLORIDA

**Institutional Review Board**

FWA00000351  
IRB00001138  
Office of Research  
12201 Research Parkway  
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

August 26, 2019

Dear Richard Thripp:

On 8/26/2019, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Modification / Update, Category 2
Title:	A Survey of Investing and Retirement Knowledge and Preferences of Florida Preservice Teachers
Investigator:	Richard Thripp
IRB ID:	MOD00000425
Funding:	None
Grant ID:	None

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or [irb@ucf.edu](mailto:irb@ucf.edu). Please include your project title and IRB number in all correspondence with this office.

Sincerely,

A handwritten signature in black ink, appearing to read "Racine Jacques".

Racine Jacques, Ph.D.  
Designated Reviewer



UNIVERSITY OF CENTRAL FLORIDA

**Institutional Review Board**

FWA00000351  
IRB00001138  
Office of Research  
12201 Research Parkway  
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

July 8, 2019

Dear Richard Thripp:

On 7/8/2019, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study, Category 2
Title:	A Survey of Investing and Retirement Knowledge and Preferences of Florida Preservice Teachers, Amazon Mechanical Turk Comparison Sample
Investigator:	Richard Thripp
IRB ID:	STUDY00000684
Funding:	None
Grant ID:	None

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or [irb@ucf.edu](mailto:irb@ucf.edu). Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Racine Jacques, Ph.D.  
Designated Reviewer

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