

DeVry University Journal of Scholarly Research

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Contents

ARTICLES:

- 6 *The State of Retirement in America: Why Johnny (and Jane) Can't Retire*
Christopher S. Rodgers and Deborah Hedderly
- 13 *Bifurcations and Newtonian Properties of Chua's Circuits with Memristors*
Wieslaw Marszalek
- 22 *Medicine of Mindfulness: A Prescription for Faculty Vitality and Student Learning*
Jerry Durbeej and Sarah M. Nielsen
- 31 *New Learning Models and Methodologies Shaping the Future of Higher Education*
Andrea Henne and Shawn A. Schumacher

BOOK REVIEW:

- 38 *Solving the Problem of Solving Problems*
Gabrielle Bonner Smith



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TABLE OF CONTENTS

A Message from the Provost, Senior National Dean of Faculty and Managing Editors.....	2
Editorial Board	3
Journal Information	3
Peer Reviewers for this Issue.....	3
Institutional Review Board (IRB) Guidelines for Research.....	4

LETTERS TO THE EDITOR:

Forward by Audra Spicer, PhD	5
James Schneider, MA	5
Alvaro Azevedo Neto, PhD	5

ARTICLES:

Paper from the College of Business & Management

<i>The State of Retirement in America: Why Johnny (and Jane) Can't Retire</i> Christopher S. Rodgers and Deborah Hedderly	6
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Paper from the College of Engineering & Information Sciences

<i>Bifurcations and Newtonian Properties of Chua's Circuits with Memristors</i> Wieslaw Marszalek	13
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Papers from the College of Liberal Arts & Sciences

<i>Medicine of Mindfulness: A Prescription for Faculty Vitality and Student Learning</i> Jerry Durbeej and Sarah M. Nielsen	22
<i>New Learning Models and Methodologies Shaping the Future of Higher Education</i> Andrea Henne and Shawn A. Schumacher	31

BOOK REVIEW:

<i>Solving the Problem of Solving Problems</i> Gabrielle Bonner Smith	38
Call for Papers, June 2016 Issue.....	39
Call for Book Reviews, June 2016 Issue.....	40
Call for Letters to the Editor, June 2016 issue	40
Call for Papers (Portuguese), June 2016 Issue	41
Call for Book Reviews (Portuguese), June 2016 Issue	42
Call for Peer Reviewers and Translators (Portuguese), June 2016 Issue	42

A MESSAGE FROM THE PROVOST, SENIOR NATIONAL DEAN OF FACULTY AND MANAGING EDITORS

Welcome to the second volume, second issue of the DeVry University Journal of Scholarly Research. This release includes four diverse papers authored by our faculty, a book review section and a new *Letters to the Editor* section, through which Professor Alvaro Azevedo Neto makes a compelling case for collaboration. Professor Neto has also joined the journal team as our Brasil Editor to help us bring the journal to an international audience. He is currently working with DeVry Brasil faculty on paper submissions for publication and we are looking forward to featuring their work in upcoming issues.

As always, we are proud of our authors who have contributed their time and talent to the journal. Their papers demonstrate the range of scholarship, knowledge and talent faculty bring to our university. A synopsis of each paper is provided below:

Our first paper, "The State of Retirement in America: Why Johnny (and Jane) Can't Retire," examines how over the past fifteen years, Americans have seen their retirement savings, equity in their homes, and their employment security essentially evaporate.

Our second paper, "Bifurcations and Newtonian Properties of Chua's Circuits with Memristors," is about the new opportunities provided by memristors in electronic circuits and mobile devices, as well as in computer engineering, telecommunications and astrophysics.

Our third paper, "Medicine of Mindfulness: A Prescription for Faculty Vitality and Student Learning," proposes that mindfulness is instrumental in reinforcing teaching and learning, and that mindfulness can potentially address the loss of faculty vitality and enhance student learning.

Our final paper, "New Learning Models and Methodologies Shaping the Future of Higher Education," examines how colleges and universities in the United States and around the world are addressing the transformation from traditional methods of teaching and learning.

In addition to our authors, we have many contributors who work hard to bring you each journal. We dedicate this issue to the memory of Harrison R. Burris, professor in the College of Business & Management at the Long Beach campus, and Web and New Media Editor for our journal. Harrison was instrumental in helping us get the journal off the ground and encouraging the Editorial Board to seek the International Standard Serial Number designation. Harrison's contributions live on as we publish our fourth issue of the journal.

To find current and past issues of the journal, visit the DeVry University Newsroom: newsroom@devry.edu.

Sincerely,



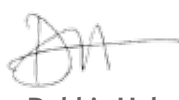
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JOURNAL INFORMATION

The *DeVry University Journal of Scholarly Research* (ISSN 2375-5393 1) is a semi-annual multi-discipline peer-edited journal devoted to issues of scholarship and education research. The journal is the work of the faculty, staff and administration of DeVry University. The views expressed in the journal are those of the authors and should not be attributed to the sponsoring organizations, or the institutions with which the authors are affiliated.

MANUSCRIPT SUBMISSIONS INFORMATION

The journal welcomes unsolicited articles on scholarship, education research or related subjects. Text and citations should conform to APA style: *Publication Manual of the American Psychological Association* (6th ed.). Because the journal employs a system of anonymous peer review of manuscripts as part of its process of selecting articles for publication, manuscripts should not bear the author's name or identifying information.

Electronic submissions of manuscripts (MS Word) and all other communications should be directed to:

DUJOSR@devry.edu

EDITORS AND REVIEWERS

DeVry faculty who wish to apply for positions on the Journal's board of editors or as reviewers of manuscripts should contact Sarah Nielsen or Deborah Helman.

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The following DeVry faculty served as peer reviewers for this issue. We thank them for their service.

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DeVry University Journal of Scholarly Research

INSTITUTIONAL REVIEW BOARD GUIDELINES FOR RESEARCH

DeVry University has an Institutional Review Board (IRB) to protect the rights and welfare of humans participating as subjects in a research study. The IRB ensures the protection of subjects by reviewing research protocols and related materials. DeVry University's colleagues and master's degree students who want to conduct research, must first contact the IRB for an application. Once received, the IRB will review the application and supporting materials to determine if all criteria have been met before approving the research.

In support of helping colleagues and students gain an in-depth understanding of ethical research processes, the IRB obtained a Collaborative Institutional Training Initiative (CITI) membership. CITI provides globally accepted training that aids the research process. Those who wish to submit applications to the IRB are required to complete CITI training beforehand.

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LETTERS TO THE EDITOR

SECTION FORWARD

The Letters to the Editor section is a fresh inclusion in our *DeVry University Journal of Scholarly Research*. In this issue, we present a letter suggesting ways that our journal can support conference participation and one that solicits cooperation between DeVry Brasil and US colleagues. In future volumes, your letters can be a chance for you to speak to the DeVry community at large on your ideas about scholarship and research. We welcome your questions, ideas, and engagement in the intellectual life of our faculty.

Audra Spicer, PhD

College of Liberal Arts & Sciences

The *DeVry University Journal of Scholarly Research* (DUJOSR) has provided DVU faculty with a wonderful resource for both entering and continuing scholarship. The journal, however, is only one path to scholarship, and I contend that greater emphasis needs to be placed on the role of professional conferences in faculty scholarship and development. Professional conferences are commonly used as testing grounds for papers prior to submission for publication. More than a means to an end, conferences allow for networking, development of emerging interests, continuing education, and personal and professional renewal.

The primary obstacles to broader faculty involvement in professional conferences are access to conference information and funding. While the latter point will need to be settled at the campus level, I would like to point out that there are numerous conferences occurring each month throughout the US, which should make conference attendance possible for all budgets. Regarding the former point, I propose here that a section be added to the end of each issue of the DUJOSR listing conferences by discipline for the corresponding period covered by that issue. For example, the January issue of the journal would contain listings for conferences in Business and Management, Engineering and Information Sciences, Multimedia Design and Development, and Liberal Arts & Sciences for the months of January, February, and March. This listing will not need to be exhaustive and may contain equal number links to professional organizations as actual conference information. The core purpose of this section should be to emphasize conference involvement and to provide access to information that will facilitate that involvement.

James Schneider, MA

College of Liberal Arts & Sciences

If DeVry is international, so is *DeVry University Journal of Scholarly Research* since Brasil has enthusiastically joined this publication. The DeVry Colleges in Brasil are spread mostly in the North and Northeastern regions of the country, and DeVry's most recent acquisition spread our reach to the southeast of the country to the city of São Paulo. We are made of many academic centers, where programs like engineering, communication and law thrive with health-related majors like medicine, nursing and physical education. We are still growing, and our expansion might soon bring more areas of expertise into our fold.

Ever since we joined this educational group, our faculty and colleges in Brasil have looked forward to participating with our American associates. And so, after this edition, it has become a reality for all of us. What does this contribute to the big picture? This means that we can set up collaborative approaches, where professors in South America can work with our colleagues in the north. We can set up comparative research studies and international studies in as many areas as we might think of. *DeVry University Journal of Scholarly Research* will be an excellent space to share the results.

We are all part of one great academic center, and we have the tools to go further. If any of the readers of this journal is interested in working in collaboration with one of us in the Brazilian DeVry faculty, all you need to do is get in touch and we will make it happen.

Alvaro Azevedo Neto, PhD

DeVry Brasil – Recife

The State of Retirement in America: Why Johnny (and Jane) Can't Retire

Christopher S. Rodgers and Deborah Hedderly

DeVry University, College of Business & Management and Roseman University

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Abstract

This paper presents an overview of the state of retirement in America, including the status of the nation's social security system, the viability of public and private pension plans, as well as the level of financial literacy of the American public. The findings from the literature reveal retirees have an increased risk of outliving their retirement savings, due to the potential insolvency of social security, the reduction and failure of private and public pension plans and the lack of financial literacy in the United States and its functional application. The recommendations from this study are that individuals should: (1) take responsibility for their own financial well-being and retirement; and (2) learn to maximize their return on investment in the existing social security program. This study also suggests there is a need for future research in educating current and future retirees in financial literacy and in maximizing their return on investment in the social security system.

Address correspondence concerning this document to Christopher S. Rodgers at 702-968-7049 or croddgers@roseman.edu.

Keywords: 401(k), defined benefit pension plans, defined contribution plans, Dow Jones Industrial Average, NASDAQ, Social Security Solvency, S&P 500

Over the past 15 years, Americans have seen their retirement savings, equity in their homes, and their employment security essentially evaporate. Events, beginning with the dot.com bust of the late 1990's, the corporate ethical scandals of the early 2000's, the terrorist attacks of 9/11, and, more recently, the real estate and financial markets meltdown and subsequent nationwide recession, have left relatively financially secure families and individuals doubting the sustainability of their financial well-being. Due to the 2007-2009 financial market meltdown and the following nationwide recession, personal net worth in the United States fell by nearly \$16 trillion, a 24% decrease, while national unemployment climbed to 14.7 million, peaking at 10% (Luttrell, Atkinson, & Rosenblum, 2013). Over this period, real housing prices declined an average of 35% while the value of equity investments dropped about 55% (Reinhart & Rogoff, 2009). In the aftermath, many Americans have chosen to opt out of the process, waiting for the U.S. Government, or the passage of time, to bail them out. Others have essentially lost faith in government and financial institutions, as well as the capitalist market system (Luttrell et al., 2013).

As dismal as these statistics may sound, the evidence suggests if individual American households choose to take ownership of their financial futures and return to the traditional methods of wealth accumulation and management, there is still hope these individuals can reverse the trends previously discussed (Ebeling, 2014). This study addresses the state of retirement in America, and presents actions individuals can take to increase control of this situation and create prolonged financial security as present and future retirees.

Purpose Statement

The purpose of this paper was to evaluate the state of retirement in the United States. In order to achieve this objective, the study addressed the following questions:

- What is the state of the United States' Social Security Program?
- What is the state of the United States' public and private pension plans?
- What is the state of financial literacy and financial preparedness of United States citizens?

The State of Social Security in America

Shortly after the U.S. Congress passed the Social Security Act, President Franklin Roosevelt signed into law the program that has become the foundation of the retirement plan for millions of Americans and the cornerstone of their post-retirement standard of living (Social Security Administration, 2009b). Originally designed as a supplemental retirement plan for workers, the program expanded in 1939 to add survivor benefits and benefits for retirees' spouses and children, as well as to provide disability benefits to workers in 1959 (Social Security Administration, 2009b). Since its inception until 2009, the program has paid out more than \$11.3 trillion in benefits and has collected over \$13.8 trillion in contributions (Social Security Administration, 2009b). In 2014, approximately 59 million Americans were expected to receive some form of benefit from the Social Security Program (Social Security Administration, 2015).

Due to the expansion of the program, and despite several contribution rate increases, the program has operated at a deficit at least 11 times prior to 2009 (Social Security Administration, 2009b) and at least one time in the past five years (Soneji & King, 2013). The most concerning was a string of deficit years beginning in 1975 and continuing until 1982 (Social Security Administration, 2009a). Over this period, the Social Security Trust Fund decreased by nearly 50%, from \$38 billion to about \$20 billion, leading to some relatively aggressive changes to the way the system currently operates (Social Security Administration, 2009a).

In 1983, President Reagan and Congress constituted a committee composed of appointed members and chaired by Alan Greenspan to make recommendations leading to increases in the Federal Insurance Contributions Act (FICA) payroll tax and other changes to the way the program was funded and administered. These additional recommendations were to: (a) increase the taxable percent of Social Security Benefits; (b) draft previously exempt federal employees into

the program; (c) reduce or delay annual cost of living adjustments to current retirees; and (d) other significant changes essentially designed to improve the solvency and sustainability of the program (Social Security Administration, 2009b). Despite these comprehensive changes to the program in 1983, in 2010, the Social Security Administration expended \$49 billion more in benefits than it collected from payroll contributions, leading to estimates from the Government Accounting Office (GAO) that the Social Security Trust Fund could be depleted as early as 2034 or sooner unless additional decisive, corrective measures are taken again by Congress and the president (Social Security Administration, Office of the Chief Actuary, 2015).

Many reasons have been identified for the deteriorating state of the Social Security Trust Fund. Goss (2010) cites the aging population of Americans as one of the most commonly acknowledged causes. Since about 1975, there have been about 3.3 workers for each individual drawing Social Security Benefits. By 2030, this ratio is expected to fall to 2:1, resulting in a 67% increase in the amount of contributions necessary from each worker to cover the cost of one retiree. Goss (2010) also observed increased demand for disability benefits, fluctuations in the economy and the workforce, and a reluctance of politicians to engage in a productive dialogue on how to save the program have also been presented as contributors to the potential insolvency of the system.

A recent poll reported 51% of those surveyed who were not yet retired did not expect the Federal Government to deliver fully on the retirement benefits it promises today, and nearly 64% of non-retirees under the age of 49 expect no benefit at retirement from the Social Security Program (Newport, 2015). Even the Social Security Administration (SSA) in their annual trustees' report acknowledged the trust fund as it is currently being funded and invested is not expected to completely fulfill its obligation to retirees beyond the year 2034 (Social Security Administration, Office of the Chief Actuary, 2015). The trustees' report goes on to suggest after 2034, the Social Security Trust Fund will be exhausted, and the taxes collected would only be sufficient to pay about 75% of the scheduled benefits through 2088. The report concludes both Social Security and Medicare based on current projections are not sustainable, and require immediate legislative action in order to avoid disruptive consequences for both beneficiaries and taxpayers. The trustees suggest timely action by Congress and the president will not only give the public more time to prepare for these adjustments, but could also soften the adverse impact on vulnerable populations (Social Security Administration, Office of the Chief Actuary, 2015).

The State of Pension Plans in America

Traditional, defined benefit corporate pension plans in the United States have virtually vanished and the ones left, including public pension plans, are becoming increasingly unsustainable as a post-retirement benefit. In addition, many plans are currently underfunded and technically insolvent (Siedle, 2013). Defined benefit plans are retirement plans where the employee's life-time benefit is determined by a formula, typically based on the pensioner's tenure, salary and age as opposed to defined contribution plans, where the retiree's benefit is determined by how much they contribute into their qualified accounts and how well their selected investments perform (Biswas, 2014). The percentage of American workers covered by defined benefit pension plans has declined from 38% in 1980 to only 20% in 2008, while private-sector defined benefit plans have decreased from 28% in 1979 to about 3% by 2011 (Employee Benefit Research Institute, 2014). At the same time, participation in defined contribution plans has increased from 7% in 1979 to about 31% in 2011 (Employee Benefit Research Institute, 2014). These trends are considered concerning since a retiree's account value at retirement under defined contribution plans, such as 401k and 403b, are largely determined by the employee's ability to make adequate contributions to the plan and effective investment decisions under volatile, complex and changing market conditions with uncertain returns (Butrica, Iams, Smith, & Toder, 2009).

Since the most recent recession, 31 states offering defined benefit pension plans have cut retirement benefits for newly hired employees, 26 now require having reduced benefits for new hires, 26 have required increased contributions from workers, and nine have lowered their cost of living adjustment for existing retirees (Sivy, 2012). In 2006, a study showed nearly 33% of non-federal public pension plans were only 88% funded, and this number increased to about 46% after 2008 (Butrica et al., 2009). Major metropolitan areas, such as Chicago (Jones, 2015) and Detroit (Woodall, 2013), have recently had their employee pension plans deemed unsustainable and technically insolvent.

In the private sector, more than 66% of the S&P 500 companies reported having defined benefit plans, but as of June 2012, only 18 reported being "fully funded" (Sivy, 2012). In the last two decades, the Pension Benefit Guaranty Corporation (PBGC) has assumed the pension plans of United Airlines (\$7.4 billion), Delphi (\$6.1 billion), Bethlehem Steel (\$3.7 billion), and several others totaling over \$27 billion (Brandon, 2010).

Prior to 1978, the primary regulator of private pension plans was the Internal Revenue Service of the United States and there was very little, if any, effective protection afforded to employees and pensioners covered under these plans (United States Department of Labor, 2015b). Soon after Studebaker-Packard filed for bankruptcy in 1964 and ceased operations, it also abandoned its employee pension plan, leaving thousands of their workers not only without a paycheck, but without their earned pensions (Steers, 2013). Congress studied the ramifications of this and other similar defaults, and officially acted in 1974 with the passage of the Employee Retirement Income Security Act (ERISA). The responsibility of Congress was to set and oversee the private health and pension programs with the primary goal of protecting employees covered under these plans (United States Department of Labor, 2015a). Soon after, Congress authorized the formation of the Pension Benefit Guarantee Corporation (PBGC) as a private corporation to act basically as a custodian and funder of last resort of underfunded and abandoned pension plans (Pension Benefit Guarantee Corporation, 2015). As of 2013, over 42 million workers and retirees in more than 24,000 private pension plans are protected by PBGC coverage with premiums paid for by the participating plans, not employee or taxpayer contributions (Pension Benefit Guarantee Corporation, 2015).

Even with government programs like ERISA and pension plan insurance programs like the PBGC, the future of defined-benefit pension plans may still be in doubt. The PBGC reported prior to 2013 it had already assumed responsibility for 4,600 failed plans covering over 900,000 retirees with an additional 620,000 workers scheduled to receive benefits insured by the guaranty corporation when they retire. In 2013 alone, the PBGC assumed responsibility for an additional 111 failed single-employer plans, covering an additional 57,000 more people (Pension Benefit Guarantee Corporation, 2013). Although the PBGC received premiums from employers, and consistently met or exceeded its projected returns on invested capital requirements, the program has operated at a deficit since 2002 (Pension Benefit Guarantee Corporation, 2013). Even with authorization from Congress to raise premiums to both single-employer and multi-employer plans since 2012, the deficit has continued to grow from about \$3 billion to \$35 billion over this 12 year period, and if this trend continues, the PBGC may have to rely on taxpayer subsidies to keep the program solvent in the near future (Pension Benefit Guarantee Corporation, 2013).

The State of Individual Retirement Accounts and Financial Literacy in America

According to the U.S. Senate Committee on Health, Education, Labor and Pensions (HELP), about 50% of Americans have less than \$10,000 in retirement and other savings (Harkin, 2012). The study also notes only about 14% of workers are confident they will have enough money saved for a comfortable retirement, down from 23% in 2002, while 69% believe they could save until age 66 and still not have enough savings to cover their retirement needs.

The average balance in 401(k)s and other qualified retirement accounts for 65 year olds is estimated to be between \$25,000 to \$100,000, and it is also estimated three-quarters of those surveyed had \$30,000 or less in their personal retirement accounts (Siedle, 2013). Fifty-nine percent of Americans surveyed indicated a concern of not having adequate savings when they retired as their top financial worry (Dugan, 2014), up from 53% in 2011 (Newport, 2011). Over 24% of non-retirees surveyed in 2011 expected to have to work at least part-time after they reach retirement age, and only 18% believed they would be able to ever stop working all together (Jones, 2011).

In the 2012 Consumer Financial Literacy Survey, less than half of the 1,007 households surveyed admitted to having a household budget (Harris Interactive Inc. Public Relations Research, 2012). The study also indicated about 33% of households surveyed fail to pay their bills in a timely manner, 39% have credit card debt that is carried over each month, 59% are saving less than in the past, and 25% are currently spending more. Over 42% admitted they would have to give themselves a "C" or less on their personal finance knowledge (Harris Interactive Inc. Public Relations Research, 2012). As of March 2014, it was estimated U.S. households carried about \$11.65 trillion in personal debt, including \$8.2 trillion in mortgages, \$875 billion in auto-loans, \$1.1 trillion of student loan debt and \$659 billion in revolving debt (Shah, 2014).

One of the greatest dangers facing retirees today is the increased risk of outliving their retirement savings, even with third party payments from social security and pensions. The average life expectancy in the United States in 2013 was 78.8 (Centers for Disease Control and Prevention, 2015), while an individual who reaches the age of 62 today will most likely live well into their 80's (Social Security Administration, Office of the Chief Actuary, 2011).

Most of the literature suggests the United States Congress and the president, either by legislation or the formation of a nonpartisan, executive committee, will most likely act in time to save the Social Security program and extend the life of the program for at least another generation or two. Even if and when the government does act, though, it should be noted Social Security was never intended to be a full retirement program (Social Security Administration, Office of the Chief Actuary, 2015). The program was designed to only replace about 40% of the average retired person's post retirement cost of living, while retirees would generally need over 65% of the working income to achieve a preferred post-retirement lifestyle (Harkin, 2012).

As of 2015, an individual receiving the maximum full retirement benefit is expected to gross about \$30,000 a year (ClydeBank-Finance, 2015). The majority of Americans are expected to receive far less, due to the fact only about 6% of retirees earn enough to qualify for the maximum benefit and over 60% begin drawing benefits before reaching the current full-retirement age, which could be 65 or 66 depending on one's date of birth (Kotlikoff, Moeller, & Solman, 2015). The average benefit paid to retirees in 2013 was about \$1,263 per month, or about \$15,168 per year (ClydeBank-Finance, 2015), which is about \$3,700 above the 2013 national poverty level for a single individual (United States Department of Health and Human Services, 2015).

Findings and Recommendations

With defined benefit plans on the decline, and the future of Social Security becoming less a certainty for a growing number of workers, the ability to fund a comfortable retirement for most Americans has shifted away from the government and employers to the retiree. The ability of individuals to avoid a potential retirement shortfall will most likely depend on the willingness for current and future retirees to accept and manage their own financial futures by taking actions designed to reduce their subsequent dependency on government and employer determined benefits. This process will require future retirees to acquire the knowledge and discipline necessary to accumulate and effectively manage their personal retirement accounts and understand their Social Security benefits (Kotlikoff, Moeller, & Solman, 2015).

Although this list is not exhaustive, financial planners and other financial professionals suggest the following activities as some ways to improve personal finances:

- (a) Set financial goals and know the cost of retirement - Knowing what lifestyle is desired by the retiree and its annual cost, adjusted for inflation, is a first step in this process (Palmer, 2014). At 3% inflation, cost levels double about every 23 years. For example, a lifestyle costing \$100,000 today would cost about \$200,000 in 23 years and \$400,000 in 46 years. A retiree would need about \$1 million in savings for each \$100,000 in annual retirement income, and to maintain a \$200,000 per year lifestyle after retirement would require about \$2 million in retirement savings. There are dozens of online financial calculators, such as American Association of Retired Persons (AARP) and Bankrate.com, designed to assist future retirees in estimating how much they will need and how much they need to put away while working to reach their retirement goals.
- (b) Create a spending plan, avoid counterproductive purchases, and track spending - Other actions individuals can take are to create a spending plan or budget and track spending. Most people are typically shocked or surprised when they begin to monitor their spending. Using a practical, effective budget can help identify unnecessary, counterproductive spending and current expenditures. Financial experts recommend using budgets to identify found money available to be diverted to retirement savings or debt reduction options (Palmer, 2014).
- (c) Use debt and credit cards wisely and pay off high-interest debt quickly - Using debt productively to help households achieve long-term goals; rather than destructively moving them farther from their long-term goals, can be another effective wealth accumulation strategy. Using debt to buy appreciating or value-creating assets like real estate, dependable transportation or employment related education, rather than purchasing depreciating assets like stereo equipment or recreational toys, can be more effective in building personal net worth. Low interest, tax-deductible debt should be preferred over high-interest, non-tax-deductible debt, and the latter should be retired before the former (Palmer, 2014).

- (d) Invest early to take advantage of the power of compounded returns - The earlier individuals begin to invest, the less they have to contribute annually to achieve the same long-term investment goal (Palmer, 2014). For example, a 20-year old planning to retire on \$1 million at age 67 earning an annual rate of return of 7% would need to contribute about \$265 per month to their retirement account; whereas a 40-year old would have to contribute approximately \$1,235 per month, and a 50-year old would have to contribute over \$3,150 per month.

Other financial management actions include learning how to prepare basic tax returns, using discount rather than full-service brokers, and investing in mutual funds rather than individual stocks as investment tools can reduce service fees and improve net returns. Also, reviewing account statements on a regular basis, being sure to have adequate, but appropriate life, auto and health insurance and maintaining a long-term perspective can help (Palmer, 2014). It is also important to always keep learning. The fundamentals of long-term financial security should be just about as important to master as the career invested in to achieve it.

In order to get the most return from Social Security benefits, the literature suggests doing the following:

- (a) Educating future retirees about the Social Security program - Future beneficiaries should be aware of how much of a monthly benefit they should expect to receive; based on their retirement age, how and when to apply for the benefit, and some of the intricacies of the program, such as "file and suspend," survivor and disability benefits, and spousal benefits (Peterson, 2015).
- (b) Knowing when and how to begin claiming benefits - Taking the early retirement benefit at 62 can reduce the lifetime benefit payout rate by as much as 32%, whereas waiting to collect at age 70 can provide annual benefit of up to 132% of the full retirement age benefit (Kotlikoff, Moeller, & Solman, 2015).
- (c) Understanding the Social Security's benefit is only a foundation of the retirement plan, not the total retirement plan - As noted earlier, Social Security should be an important part of an individual's retirement plan, but a retiree's standard of living can be substantially improved if they have other sources of retirement income, such as income from third party or individual retirement vehicles (Kotlikoff et al., 2015).

Conclusions

It appears most Americans have basically two options. They can either choose to take some degree of control over their financial futures, or essentially abdicate this responsibility to another party such as the federal government or the public and private pension systems. If the existing formal systems of providing financial security for retirees continue to function as designed, then individuals who educate themselves and take responsibility for their own financial security should be better off than those who do not.

Very little of the literature offered specific recommendations on how to increase Americans' degree of financial literacy, or offered specific suggestions on how to encourage Americans to plan and save more, and to start doing each earlier in life. Future research in these areas is crucial if a sustainable outcome is to be realized.

One of two recommendations derived from the study for further research is to address what educators, parents, and employers can do to increase the probability future generations will have the tools and education necessary to succeed in an increasingly complex and dynamic financial environment. The second is to research the actions and resources necessary for present and future retirees to build and maintain a secure and sustainable financial retirement. Failure of individuals to take constructive action in the process will most likely increase the stress on a system already overburdened and presently unsustainable.

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Bifurcations and Newtonian Properties of Chua's Circuits with Memristors

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Abstract

Chua's circuits (regular and canonical) with non-linear piecewise-linear diodes replaced by memristors are analyzed in this paper. It is shown that the modified circuits have interesting bifurcation diagrams and the circuits' mathematical models can be written in the form of Newton's law $u'' = F(t, u, u')/m$, where m is constant, the variable u denotes the flux or charge, and the nonlinear function $F(t, u, u')$ contains memory terms. Thus, the second, third and fourth derivatives of the electrical variable u can be interpreted as the mechanical variables of acceleration, jerk and jounce. Also, it is shown that the systems of first-order differential equations describing the two Chua's circuits can be written as scalar differential equations of fourth degree called the jounce equations. Examples of one-dimensional bifurcation diagrams of Chua's circuits and two-dimensional hysteresis responses of memristors are also included and discussed in this paper.

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A renewed interest in memristors and memristive circuits has been developing after the Hewlett Packard lab's announcement of a successful construction of a memristive element with a charge dependent memristance (Strukov, Snider, Stewart, & Williams, 2008). Several interesting circuits with memristive elements have been proposed, and their unusual dynamical properties have been analyzed (Biolek, Biolek, & Biolkova, 2012, 2014; Chua, 2012; Georgiu, Yaliraki, Drakakis, & Barahona, 2011; Pershin & Di Ventra, 2011; Riaza, 2014). The well-known regular and canonical Chua's circuits have been modified to include memristive elements to yield oscillatory responses, including chaos (Bao, Liu, & Xu, 2010; Itoh & Chua, 2008; Jothimurugan, Thamilmaramany, & Rocha, 2014). Other memristive circuits yield periodic mixed-mode oscillations or MMOs (Marszalek & Trzaska, 2014, 2015).

MMOs are sequences of both small- and large-amplitude oscillations (or SAOs and LAOs) occurring in chemical, electrical, biological, mechanical and astrophysical systems, including dysrhythmias of human hearts and epileptic synchronizations of neurons in human brains (Brons, Kaper, & Rotstein, 2008; Krupa, Popovic, & Kopell, 2008; Marszalek & Trzaska, 2010; Marszalek, 2012; Mikikian, Cavarroc, Couede, Tessier, & Boufendi, 2008; Milton & Jung, 2003; Podhaisky & Marszalek, 2012). A typical system with MMOs is of third order, and has a cubic-type polynomial nonlinearity. Such systems are sometimes called *jerk* systems, since, in physics and mechanics, the third derivative of position (or equivalently the first derivative

of acceleration) is called the *jerk*. Various aspects of *jerk* systems, their properties and circuit realizations have been studied in the last two decades (Eichhorn, Linz, & Hanggi, 1998; Linz, 1998; Sprott, 2011; Piper & Sprott, 2010; Yu, Hu, Leung, & Chen, 2005). When a nonlinear element with current-voltage characteristic in such systems or circuits is replaced by a memristive element described by the output-input relationship $y = g(w)x$ having the internal variable W with $w' = x$ then the order of the system increases by one. So a typical third-order system becomes a fourth-order one (Bao, Liu, & Xu, 2010; Marszalek & Trzaska, 2015). This increase of order is due to the fact that the equation $w' = x$ contains a derivative term. Thus, a *jerk* circuit (i.e. the third-order Chua's circuit without a memristor) becomes now (after inserting a memristor in place of an element with algebraic current-voltage characteristic) of order four.

This paper provides a further analysis of the fourth-order memristive Chua's circuits and study of their properties in the context of Newton's second law. Several new theorems are presented. In particular, the paper demonstrates that Chua's circuits can be described by Newton's law $u'' = F(t, u, u')/m$, where the prime denotes the derivative of u with respect to the time variable t . Each such equation, when differentiated twice with respect to t , results in a fourth-order ordinary differential equation (ODE) with the derivative u'''' that can be interpreted as a *jounce* variable—the fourth derivative of the position variable $u(t)$ or the second derivative of acceleration u'' . Any such ODE can be called a *jounce* Newtonian ODE, for the same reason that the third-order ODEs and the corresponding circuits are called the *jerk* ODEs and circuits. The concept of *jounce* circuits is a further generalization of the concept of *jerk* circuits studied extensively in the circuit theory, physics and mechanics (Eichhorn, Linz, & Hanggi, 1998; Linz, 1998). This link of memristive MMO circuits with Newton's second law allows us to interpret the electrical variables as the equivalent mechanical ones, and possibly to further uncover and interpret the hidden links between certain nonlinear phenomena in memristive circuits with those specific only for mechanical systems.

Chua's Circuits and Their Newtonian Properties

This section analyzes Chua's circuits with piecewise-linear diodes replaced with memristors, and derives Newton's laws for all dynamical variables in the underlying systems of differential equations. The *regular* and *canonical* Chua's circuits with memristors are shown in Figure 1. Note that both circuits include a negative conductance, which is an *active* element, requiring special designing methods (Itoh & Chua, 2008). It is assumed that inductor L in the *regular* Chua's circuit has an internal resistance $r > 0$. The circuit is described by the following system:

$$\begin{aligned} (1) \quad & x' = k\alpha[y + (\xi - 1)x - g(w)x] \\ & y' = k(x - y - z) \\ & z' = -k(\beta y + \gamma z) \\ & w' = kx \end{aligned}$$

where: $[x, y, z, w] = [v_1, v_2, i_3, \psi]$, $k > 0$, $\alpha = 1/C_1$, $C_2 = 1$, $\beta = 1/L$, $\gamma = r/L$, $\xi = G$ and $R = 1$. The ψ denotes memristor's flux variable. The circuit comprises the negative conductance $-G < 0$, capacitors C_1 and C_2 , resistor R , inductor L (with an internal resistance r) and a flux-controlled mem-element with memductance $g(w)$ where $w = \psi$. The quantities v_1, v_2 and i_3 are the two voltages on capacitors C_1 and C_2 , and current through inductor L , respectively.

Figure 1. Chua's Memristive Circuits

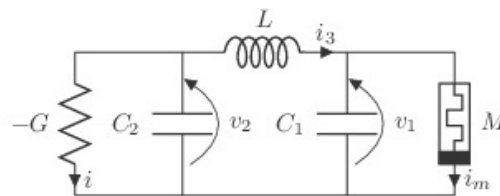
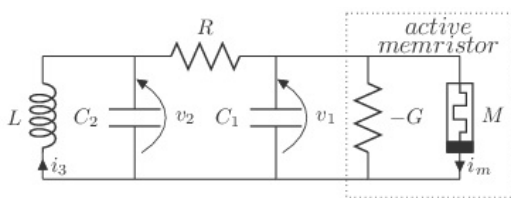


Figure 1. Chua's Memristive Circuits: regular (left) and canonical (right).

THEOREM 1: Variable w in (1) has a Newtonian formulation of $w'' = F(t, w, w')/m$, where

$$(2) \quad F/m = k[\alpha h(w) - 1 - \gamma]w' + k^2(\alpha + \beta + \gamma)w - \alpha k^3 \gamma \int w dt \\ + \alpha k^2(1 + \gamma) \int h(w) dw - \alpha k^3(\beta + \gamma) \iint h(w) dw dt$$

with $h(w) = \xi - 1 - g(w)$.

PROOF: Integrating the second equation in (1) and using the first and fourth equations gives

$$(3) \quad w'' = \alpha k^2 y + k \alpha h(w) w' \\ = k \alpha h(w) w' + \alpha k^2 w - \alpha k^3 \int y dt + \alpha k^3 \int z dt.$$

It remains to solve for $\int y dt$ and $\int z dt$ in terms of w and w' . Integrate the third equation in (1) and substitute the integral of the second equation so that

$$(4) \quad z = -\beta \int ky dt - \gamma \int kz dt = -(\beta + \gamma) \int ky dt + \gamma w - \gamma y.$$

On the other hand, the first equation in (1) yields $\int ky dt = w' / (\alpha k) - \int h(w) dw$. Therefore, $\int z dt = -(\beta + \gamma)w / (\alpha k) - (\beta + \gamma) \int \int h(w) dw dt - \gamma \int w dt - \gamma \int y dt$.

Equation (3) becomes

$$(5) \quad w'' = k \alpha h(w) w' + \alpha k^2 w - \alpha k^3 \int y dt - k^2(\beta + \gamma)w \\ - \alpha k^3(\beta + \gamma) \int \int h(w) dw dt - \alpha k^3 \gamma \int w dt - \alpha k^3 \gamma \int y dt \\ = k \alpha h(w) w' + k^2(\alpha + \beta + \gamma)w - \alpha k^2(1 + \gamma) \int ky dt \\ - \alpha k^3 \gamma \int w dt - \alpha k^3(\beta + \gamma) \int \int h(w) dw dt \\ = k \alpha h(w) w' + k^2(\alpha + \beta + \gamma)w - k(1 + \gamma)w' + \alpha k^2(1 + \gamma) \int h(w) dw \\ - \alpha k^3 \gamma \int w dt - \alpha k^3(\beta + \gamma) \int \int h(w) dw dt.$$

The proof follows after some rearrangement.

The canonical Chua's circuit in Figure 1 (previous page) is described by the following ODEs

$$(6) \quad \begin{aligned} x' &= k\alpha[y - g(w)x] \\ y' &= k(z - x) \\ z' &= -k(\beta y + \gamma z) \\ w' &= kx \end{aligned}$$

where $[x, y, z, w] = [v_1, v_2, i_3, \psi]$, $k > 0$, $\alpha = 1/C_1$, $\beta = 1/L$, $\gamma = G/C_2$, and $L = 1$. As before, the quantities v_1, v_2 and i_3 are the two voltages on capacitors C_1, C_2 , and current through inductor L , respectively.

THEOREM 2: The system (6) allows a Newtonian formulation $w'' = F(t, w, w')/m$.

PROOF: The first, second and fourth equations in (6) yield

$$(7) \quad w'' = kx' = k\alpha[ky - g(w)w'] = k\alpha[-g(w)w' + k^2 \int (z - x)dt] \\ = k\alpha[-g(w)w' - kw + k^2 \int z dt].$$

Next, in order to compute $\int z dt$ let's first find

$$(8) \quad z = k \int (-\beta y + \gamma z) dt = -k\beta \int [x'/(k\alpha) + g(w)x] dt + k\gamma \int (y'/k + x) dt \\ = -\beta w' / (\alpha k) + \beta \int g(w)w' dt + \gamma [x'/(k\alpha) + g(w)x] + \gamma w \\ = -\beta w' / (\alpha k) + \beta \int g(w)w' dt + \gamma w'' / (k^2 \alpha) + \gamma g(w)w' / k + \gamma w.$$

Eq. (8) gives

$$(9) \quad \int z dt = -\frac{\beta}{\alpha k} w + \beta \int \int g(w) dw dt + \frac{\gamma}{\alpha k^2} w' + \frac{\gamma}{k} \int g(w) dw + \gamma \int w dt.$$

Substituting (9) into (7) yields

$$(10) \quad w'' = -k\alpha g(w)w' - k^2 \alpha w - k^2 \beta w + k^3 \alpha \int \int g(w) dw dt + k\gamma w' + k^2 \gamma \alpha \int g(w) dw + k^3 \gamma \alpha \int w dt \\ = -k^2 (\alpha + \beta) w + k[\gamma - \alpha g(w)]w' + k^3 \gamma \alpha \int w dt + k^2 \gamma \alpha \int g(w) dw + k^3 \alpha \int \int g(w) dw dt \\ := F(t, w, w')/m.$$

This ends the proof.

COROLLARY: The ODE systems (1) and (6) can each be recast into a *jounce* equation in variable w . Details for the *canonical* Chua's circuit only are shown below. The *jounce* equation for the ODE system (6) is

$$(11) \quad w'''' + k[\alpha g(w) - \gamma]w''' + k[k\alpha - k\gamma \alpha g(w) + k\beta + 3\alpha g'(w)]w'' \\ + k^3 \alpha [\beta g(w) - \gamma]w' - k^2 \alpha \gamma g'(w)(w')^2 + k\alpha g''(w)(w')^3 = 0.$$

PROOF: Two time differentiations of (10) give (11). Alternatively, the above corollary may be proved the following way. Time differentiation of the last equation in (6) and the first equation yield

$$(12) \quad w'' = k^2 \alpha y - k^2 \alpha g(w)w'.$$

Thus, eq. (12) yields the y and its derivatives

$$\begin{aligned}(13) \quad y &= w''/(k^2\alpha) + g(w)w'/k \\ y' &= w'''/(k^2\alpha) + g'(w)(w')^2/k + g(w)w''/k \\ y'' &= w''''/(k^2\alpha) + g''(w)(w')^3/k + 3g'(w)w'w''/k + g(w)w'''/k.\end{aligned}$$

Substituting the second equation in (6) (written in the form $z = y'/k + x$) into the third equation in (6) yields (after applying $x = w'/k$)

$$(14) \quad y'' + w'' = -k^2\beta y + k\gamma y' + k\gamma w'.$$

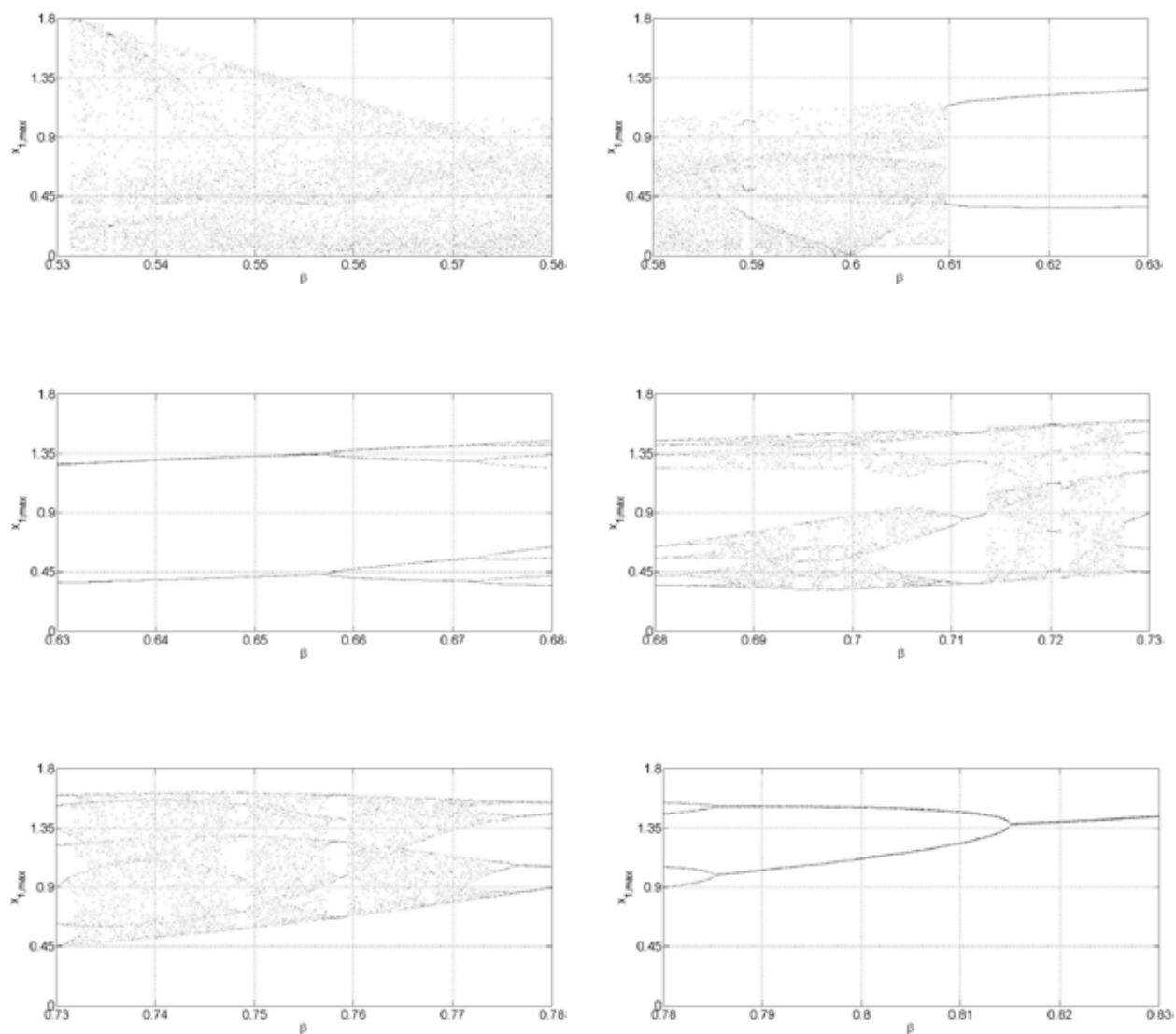
Replacing y , y' and y'' in (14) by (13) and rearranging terms gives eq. (11). This completes the proof.

Bifurcations of Chua's Circuits

Interesting bifurcations of Chua's circuits with memristors can be obtained when parameters change their value. In this section, certain bifurcation diagram for the *canonical* Chua's circuit are presented when parameter β in (6) varies in a relatively large interval $0.53 \leq \beta \leq 0.83$. The memristor in Figure 1 (p. 14) is described by the output-input relationship $y = g(w)x$ with polynomial function $g(w) = a + 3bw^2$ having constant values a and b . The remaining parameters in (6) are fixed at the following values: $\alpha = 1$, $\gamma = 1$, $a = 0.2$, $b = 1$ and $k = 100$. Numerical calculations were performed by using Matlab's function ode45 with the absolute and relative errors equal 10^{-6} for all four variables in (6), initial condition $[x(0), y(0), z(0), w(0)] = [0, 10^{-10}, 0, 1]$ and the time step of 0.001. The bifurcation diagram in Figure 2 (p. 18) presents the changes of the maximum values of the periodic solution for the first variable in (6), that is $x(t)$, when parameter β changes slowly. For example, when β is fixed for a while at the value $\beta = 0.8$, then $x(t)$ in (6) has a periodic solution (in fact, the solution is

called period-2 oscillation) with two local amplitudes at the values of approximately 1.125 and 1.500.

These values are simply obtained from the bottom right graph in Figure 2 (p. 18), where the vertical line $\beta = 0.8$ intersects the two branches of that graph. For each value of parameter β the ODE system (6) was solved for $0 \leq t \leq 200$ seconds, and the maximum values of variable $x(t)$ were identified in the interval $190 \leq t \leq 200$ seconds. The six graphs shown in Figure 2 (p. 18) were obtained with the step size $\Delta\beta = 7 \cdot 10^{-5}$. This means that each of the six graphs required 714 ($\approx 0.05/0.00007$) solutions of (6) with the above given parameters. The quantity $x_{1,\max}$ in Figure 2 is the maximum value of variable $x(t)$ in (6) identified numerically with the rules described above. As illustrated in Figure 2 (p. 18), the *canonical* Chua's circuit shows a variety of chaotic and periodic oscillations with many examples of *period-1*, *period 2*, ..., *period-n* oscillations and period-doubling and halving bifurcations.

Figure 2. *Bifurcations of Canonical Chua's Circuit***Figure 2.** *Bifurcations of canonical Chua's circuit for $0.53 \leq \beta \leq 0.83$*

Pinched Hysteresis Loops of Memristors

Figure 3 (below) illustrates typical time-domain responses. The graphs on the left are the solutions $x(t)$ of (6), that is period-2 and period-4 oscillations obtained for $\beta = 0.620$ and $\beta = 0.781$, respectively. The corresponding pinched hysteresis loops for memristors are shown on the right in Figure 3. The hysteresis loops are fingerprints of memristive circuits. The amplitudes of period-2 solution are around 1.2 and 0.4 as indicated by the top right graph in Figure 2 (for $\beta = 0.620$) and also by the corresponding two top graphs in Figure 3. Similarly, the amplitudes of period-4 solution are around 1.6, 1.5, 1.1 and 0.9, as shown by the lower right graph in Figure 2 (for $\beta = 0.781$) and the bottom two graphs in Figure 3. The coordinates $g(w)x$ and x in the graphs in Figure 3 denote the current and voltage, respectively, if a memductor is used, or the voltage and current, respectively, if a memristor is considered.

Figure 3. Time-Domain Solutions

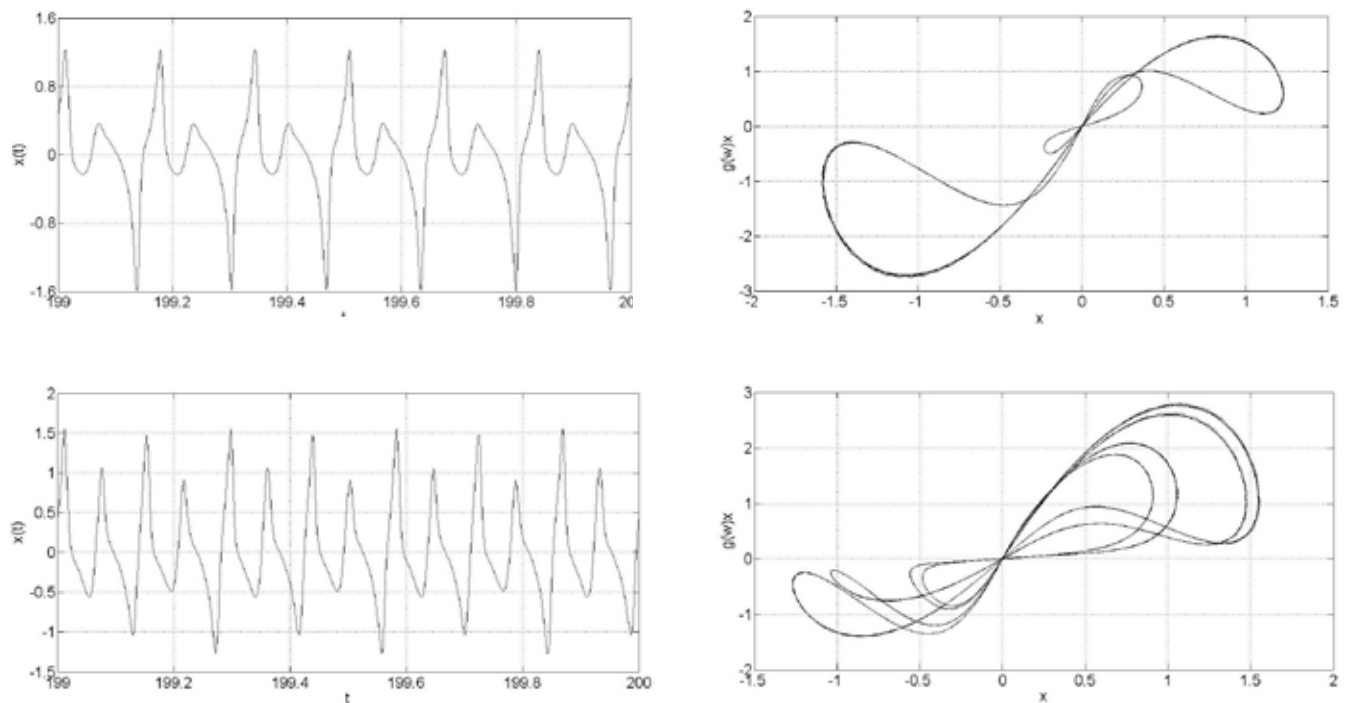


Figure 3. Time-domain solutions for $x(t)$ (left panels) and pinched hysteresis loops $g(w)x(t)$ versus $x(t)$ (right panels). The top two graphs were obtained for $\beta = 0.620$ while the other two for $\beta = 0.781$.

Conclusions

Chua's circuits with memristors have been analyzed in this paper, and the circuits' Newtonian properties have been proven. Both *regular* and *canonical* Chua's circuits can be described by Newton's second law and scalar fourth-order *jounce* equations. The above ideas are new concepts presented in this paper from the mathematical point of view. Bifurcation diagrams of the circuits show both chaotic and periodic oscillations of various types. The circuits undergo several period-doubling and halving bifurcations in the chosen interval of β . Although the bifurcations have been illustrated for the parameter β only, similar results could also be obtained for other parameters in both (1) and (6).

The results strongly suggest that the concepts of memristive circuits and systems should be included in the teaching of circuits and systems at graduate schools first, and then expanded in a few years to the undergraduate level. Although the area of mem-elements (memristors, meminductors and memcapacitors) is quite new, it offers many new opportunities, not only in electronic circuits and mobile devices, but also in computer engineering, telecommunications and astrophysics. In spite of the obvious achievement announced by Hewlett Packard

(Strukov et al., 2008), the important question seems to be still open: When will memristors (as passive elements) become widely available (just like resistors, inductors and capacitors are) for the use by engineers and designers of electronic circuits and devices?

Several research topics involving mem-elements seem to be also interesting for further investigation. For example, one may ask: How can one use mem-elements in the design of passive and active filters? Will the new filters perform better than those without mem-elements? Another interesting issue, from the manufacturing point of view, is to investigate intriguing properties of various materials other than the titanium dioxide (used by Hewlett Packard) to construct different types of memristors. One can also try to construct mechanical systems described by the *force* terms $F(t, w, w')$, given in (2) and (10), to have dynamical systems equivalent to Chua's *regular* and *canonical* circuits. This, however, seems to be an extremely difficult task, since the expressions for $F(t, w, w')$ in (2) and (10) are quite complicated.

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Medicine of Mindfulness: A Prescription for Faculty Vitality and Student Learning

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Abstract

In the interest of instructional vitality and maintaining an invigorated culture of teaching and learning, educators over the past several decades have practiced the ancient principle of mindfulness. The proposition that mindfulness is instrumental in reinforcing teaching and learning is substantiated by the studies cited in this paper. Mindfulness can potentially address the loss of faculty vitality and enhance student learning. An overview of the concept of mindfulness is presented, followed by its current incarnation. Research into mindfulness in medicine is included, as well as mindfulness in the workplace, suggesting that mindfulness promotes three keys of work engagement necessary to maintain and sustain faculty vitality. Mindfulness in education, including current practices in contemplative pedagogy, has a great impact on students' emotional health, empathy, and learning. A conclusion and implications for practice are included.

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Early in his career, American writer Henry David Thoreau decided to isolate himself from the world, retreating into the woods for two years with the following purpose:

I wished to live deliberately, to front only the essential facts of life, and see if I could learn what it had to teach, and not, when I came to die, discover that I had not lived. I wanted to live deep and suck out all the marrow of life, to live so sturdily and Spartan-like as to put to rout all that was not life, to cut a broad swath and shave close, to drive life into a corner, and reduce it to its lowest terms. (Thoreau, 1854/2009, para. 16)

After immersing himself in nature and embracing the simple pleasures of life, Thoreau emerged from the woods with a renewed sense of being and a manuscript for what would arguably become his most acclaimed work, *Walden*. Though the term "heart-mind connection" did not exist at the time, he and other proponents of simplicity helped to lay the groundwork for our current concept of *mindfulness*. To achieve this insight, most of us do not have the luxury of embarking on a spiritual retreat for two days, let alone two years, but given the present state of affairs in education, even a two-minute respite is welcome.

Faculty depleted of their vitality may question their choice of institution, even their careers. In a survey of part-time and full-time faculty, nearly half reported that during the previous two years, they had thought about leaving (Berrett, 2012). The survey further reveals that only one third reported achieving a healthy life-work balance; three-fourths observed that their greatest sources of stress consist of institutional demands and

an eroding of personal time (Berrett, 2012). About half of faculty respondents cite the stress of working with unprepared and unmotivated students as drawbacks to their career fulfillment (Cipriano & Riccardi, 2011). With job security eroding, given the decreasing number of tenured or tenure-track positions, and retirement benefits disappearing, many are putting off retirement (Cipriano & Riccardi, 2011).

Faculty concerns are not isolated geographically, as data suggests that American professors experience the same level of job satisfaction with their European neighbors, though slightly lower levels of satisfaction than faculty from East Asia (Finkelstein & Cummings, 2012). And the same aspects of the profession that make junior and mid-career faculty unhappy—such as lack of mentoring opportunities and personal and family benefits—also contribute to dissatisfaction among senior professors (Wilson, 2012). With an increased expectation for around-the-clock accessibility, accountability, and research productivity (Trower, 2010), the demands on faculty can lead to burnout.

All of this has trickled down to student learning, as faculty are not making the kind of substantial impact on student learning as previously thought (Arum & Roksa, 2011). For students, the educational process has devolved into a system that encourages standardization, which stifles the creative process inherent in learning. Students are less enthused and curious when the instructional curriculum insists on uniformity, and evidence suggests that they have become more interested in the college credential rather than the actual learning it implies. Students are not prepared for their jobs and do not have the work ethic required to succeed (“Prepared for the Job,” 2014). College graduates exhibit a decreased literacy rate as they exit without basic skills that employers expect (Spellings, 2006). Further evidence of graduates’ lacking requisite skills can be found in companies who advertise for employees with certain skill sets, yet cannot find qualified candidates. A study by the International Monetary Fund concluded that there is an increasing mismatch between the skill sets of candidates and the needs of employers, with mismatches in some states nearing all-time high levels (as cited in Kanter, 2011). When skill acquisition has not been achieved, and college graduates find themselves underemployed, this systemic failure leaves faculty feeling blamed and defeated.

The prescription for this malaise in faculty vitality and student learning is mindfulness and its practices inside and outside of schools. Faculty who practice mindfulness holistically are more likely to be successful, motivated, and enjoy increased vitality in their craft. Students who engage in mindfulness practices are

also more likely to experience better learning and connection to education. Specifically, these five major sections are presented below in the following order: (a) the origins and concept of mindfulness; (b) its current incarnation; (c) mindfulness in medicine; (d) mindfulness in the workplace, including subsections on work engagement and job satisfaction, workplace burnout, keys to work engagement, and restoring faculty vitality; (e) mindfulness in education, including subsections on student emotional health, empathy, and student learning; and (f) implications for applied mindfulness. Student and faculty engagement through mindful practices receive particular emphasis.

Mindfulness and Its Origins

Mindfulness and meditation are often used interchangeably, though there is a subtle difference. Generally, mindfulness refers to observing and bearing witness to whatever happens to arise in consciousness when the mind is freed of thoughts and emotions, whereas meditation refers to a means of disciplining the mind through focus on a particular object of thought (Slavik, 2014). Mindfulness is an ancient Buddhist practice aimed at achieving a harmony on two levels: inner integration with oneself and concord with the immediate world. Buddhist meditative practices focus on awareness, clarity, compassion, and emotional balance (Williams & Kabat-Zinn, 2011). None of these are novel ideas; the substance of mindfulness has been the root of Buddhism for centuries and can be traced in the works of scholars and educators such as Ralph Waldo Emerson, Henry David Thoreau, T.S. Eliot, and William James. The discipline stresses the appreciation for the present moment, which is focused on nurturing a personal relationship with oneself. This “being in the moment” is considered a sacred watch, which demands enduring patience, care, and insight. In pursuing mindfulness as a habit, the practitioner does not take life for granted, but strives to understand underlying issues by way of *quiet* silence. This process of centering oneself is akin to Emerson’s quest for transcendence: “resigning [one] self to the divine aura which breathes through forms, and accompanying that” (1844/2014, p. 274). Being watchful over the mind is a fundamental Buddhist practice, which acknowledges the mind as the defining force of human consciousness: “What we are today comes from our thoughts of yesterday, and our present thoughts build our life of tomorrow: our life is the creation of our mind” (Mascaro, 1973, p. 35).

The daily grind and stress of our everyday lives often do not allow us the luxury of listening and analyzing objectively; the practice of mindfulness forces the practitioner to concentrate on issues of the moment.

The following conversation between a student and his teacher as referenced in Kabat-Zinn (1994) provides the underlying scope of this practice:

Question [student]: How can I set right a tangle which is entirely below the level of my consciousness?

Nisargadatta [teacher]: By being with yourself ... by watching yourself in your daily life with alert interest, with the intention to understand rather than to judge, in full acceptance of whatever may emerge, because it is there, you encourage the deep to come to the surface and enrich your life and consciousness with its captive energies. This is the great work of awareness; it removes obstacles and energies by understanding the nature of life and mind. Intelligence is the door to freedom and alert attention is the mother of intelligence. (p. 10)

Mindfulness allows observing the mind purposefully and without judgment—whatever the state of one’s mind or feeling, it is already there, and need never be resisted or suppressed. A core principle of mindfulness is that the neutral position is required to generate purposeful awareness; the neutral position is an analytical state of mind that allows practitioners to truly and keenly observe any present reality. This objective observation, driven by a non-judgmental approach, allows practitioners to realize possibilities for transformation and personal growth, since their perceptions are no longer filtered through the blinders of prejudices and conditioned behavior. It allows the rejection of a negative “self story” and a fresh interpretation of the authentic self. To be mindful is to have an increased awareness of a vitality and wisdom that can improve the very quality of our lives. Kabat-Zinn (1994) explains that through prescriptive mindfulness, practitioners can identify and address mindlessness, and through this process have the potential to tap into their inner wisdom and vitality.

Mindfulness and its Current Incarnation

Interest in mindfulness-based applications started in the early 1980s, and in the late 1990s, interest rose dramatically, with publications about research and development in health, science, and more recently, education (Williams & Kabat-Zinn, 2011). The popularity of mindfulness in these areas is the result of open-mindedness of practitioners to take centuries-old teachings from Asian monasteries and present them in retreats and clinics (Williams & Kabat-Zinn, 2011). The original goal of Mindfulness Based Stress Reduction (MBSR) in Massachusetts, the first clinic to integrate mindfulness into modern medicine, was to promote and encourage elevated levels of sanity, well-being,

and kindness (Williams & Kabat-Zinn, 2011). Currently, there are mindfulness retreats, seminars, and college courses in every subject including sociology, religion, law and business, and a newly formed professional organization, the Association for Contemplative Mind in Higher Education. This “quiet revolution” of mindfulness is now more organized and popular than ever (Zajonc, 2013, p. 83).

Practitioners of mindfulness do not need the silence of a mountain retreat to practice mindfulness; they can be quietly watchful over their minds even in environments as tumultuous Times Square. This teaching does not conflict with any religious beliefs, nor is there any attempt to sell an ideology. Although naysayers are quick to dismiss it as a passing fad, a *kumbaya*-like attempt to pacify the masses, few can quibble with the mounting research revealing its benefits to our health and well-being. The research on mindfulness is so compelling that its proponents can now be found in courses on college campuses, employers from Silicon Valley to Wall Street, juvenile hall inmates, hospitals, places of worship, and schools (Shapiro, 2015). Mindfulness has impacted medicine, the workplace, and education.

Mindfulness in Medicine

Zen masters and seekers of a more fulfilling life have been practicing mindfulness for thousands of years, and now modern medicine has acknowledged the benefits of meditative mindfulness. Mindfulness helps people to regulate their emotions and relieve stress. It has been shown to improve chronic pain, arthritis, anxiety, and depression (Davidson et al., 2012; Slavik, 2014). Mindful practitioners exhibit improved immune system functioning as well as better emotional stability, well-being, and focus; there is even a documented increase in one’s sense of compassion (Shapiro, 2015). Mindfulness techniques have been used to treat eating disorders, decrease aggression and hostility, and to help those in recovery from cancer, substance abuse, and heart problems (Grace, 2011). Mindfulness-based therapy is a preferred treatment for patients with major depression (Williams & Kabat-Zinn, 2011). The recurring finding on emotional regulation has obvious applications in education, as the ability to focus is vitally important in both teaching and learning. Plus, the regulation of emotions is a critical ingredient for success in the classroom, particularly since mindfulness practices increase positive energy. Mindfulness practices positively influence the brain as neuroplastic, increasing areas in the brain responsible for positive emotions and reducing areas responsible for negative emotions and anxiety (Grace, 2011).

Mindfulness in the Workplace

It is instructive to look at studies in work engagement and job satisfaction to bolster the argument that mindfulness can lessen the chance for faculty burnout. The three keys of work engagement — energy, involvement, and self-efficacy — are then explored as they help to restore faculty vitality.

Work Engagement and Job Satisfaction

There is a subtle difference between the terms *work engagement* and *job satisfaction*: Work engagement focuses on dedication, activation and vigor, in contrast to the passive conception of employee well-being (Schubert-Irstorza & Fabry, 2014). When employees experience job satisfaction, they are happier, healthier, and are less likely to be absent or look for work elsewhere (Schubert-Irstorza & Fabry, 2014). What makes employees satisfied varies, but some of the most cited factors include the content and meaningfulness of work, autonomy, opportunities for growth and development, and good communication (Schubert-Irstorza & Fabry, 2014). For mindfulness to be successful in the workplace, it needs to fulfill some if not all of these factors; if not, faculty are susceptible to burnout. Indeed, faculty who are fully engaged, but unfulfilled by that engagement, are likely to suffer.

Workplace Burnout

Burnout in the workplace has been studied for years, pioneered by Maslach and her colleagues, who developed the Maslach Burnout Inventory used by organizations to determine whether it exists in its employees. They posit that there are six correlates for burnout: conflicts of values, a sense of unfairness, the breakdown of community or collegiality, work overload, inadequate rewards, and loss of control (Maslach, Leiter, & Jackson, 2012). Burnout, according to Maslach et al. (2012), manifests itself in three areas: (a) emotional exhaustion, causing impaired work performance and health issues; (b) distancing or depersonalization, resulting in lack of empathy; and (c) inefficacy, leading to a possible breakdown in self-confidence and motivation.

Keys to Work Engagement: Energy, Involvement, and Self-efficacy

Seen from a positive perspective, engagement is the antidote to burnout. The opposite of these three areas of burnout — emotional exhaustion, distancing, and inefficacy — are energy, involvement, and self-efficacy or self-confidence (Schubert-Irstorza & Fabry, 2014). Positive energy, determination, enthusiasm, resilience with setbacks, and pride are attributes of engaged workers (Schubert-Irstorza & Fabry, 2014). In terms of teaching, the most relevant attribute is enthusiasm and positive energy. Engaged workers transmit their

enthusiasm and engagement in a cross-over effect to others (Schubert-Irstorza & Fabry, 2014). Faculty who are fully engaged transmit their contagious enthusiasm to colleagues and students.

Furthermore, research studies show that mindfulness increases employee engagement and decreases the likelihood of burnout. Workplace-based mindful practices have been found to help employees manage their emotions, cope with their workload, adapt to new situations, and maintain more positive relationships (Slavik, 2014). In another study, the benefits of mindfulness included better communication practices among departments, improved job performance and satisfaction, and enhanced feelings of well-being (Beer, 2010). The evidence is clear and convincing that mindfulness in practice has positive effects among employees in the workplace. Mindfulness increases instructional vitality, as explained in the following section.

Restoring Faculty Vitality

Mindfulness can powerfully transform our national malaise by increasing individual and collective attention, promoting emotional balance, and most importantly, creating subject/object awareness by which the practitioner becomes wholly vested in the present moment. Mindful awareness is essential to restoring vitality and combating burnout while increasing work engagement. It is imperative to address the loss of faculty vitality, which has been problematic for decades. It has been left unremediated by the usual prescriptions, which failed to recognize this widespread malaise. Schubert-Irstorza and Fabry's 2014 research identifies keys of work engagement: energy, involvement, and self-efficacy (or self-confidence), all of which are cultivated by the practice of mindfulness.

Energy. A workplace conducive to truly engaged employees promotes the kind of energy that combats lackluster work performance and employee health. For faculty, this means an active mindset that connotes control of one's actions and openness to new avenues of thinking. A renewed and sustainable energy is possible through mindfulness. Langer (1997) sees renewal as transformational vitality, a willingness to be open to another system of thought, and to "see" and address issues (especially of the mind) from different angles instead of relying only on preconditioned and linear notions that may not have worked over the years. This willingness to explore options requires energy on all levels, and mindfulness practice provides that energy. The educator who practices mindfulness is trained to be "internally coherent, aware of the subtle energies that are part of creating the possibility for contingent communication and resonance that establishes dialogic relationship and lays the foundation for creative thinking

and interbeing” (Bai, Scott, & Donald, 2009, p. 332). These “subtle energies” are fires stoked by regular practice of mindfulness. In a meta-analysis of studies on faculty burnout, Watts and Robinson (2011) found that work overload was a strong predictor of burnout; age was also a factor, as younger faculty were more likely to experience burnout, with distancing found more in men and emotional exhaustion in women. Distancing and emotional exhaustion can be combatted with the energy of mindful practices.

Involvement. Employees who are involved, connected, and compassionate are not just better human beings; they are also better workers. The paradox of mindfulness is that although it forces inward thought, it helps practitioners to find connections and become more involved in their work. The daily contemplative practice of mindfulness involves a process of calming and expanding the mind to enhance focus and awareness. It is critical for faculty, whose focus on the present and attention to detail should be unwavering. Mindful practices can be instrumental in reinforcing awareness of efficient time management and controlling distracting behavior (Dufon & Christian, 2013). An unfocused mind does not produce high quality work; mindfulness teaches practitioners to be watchful of wandering attention, as it can unfavorably affect the creative process and dampen the capacity to understand connections precisely. The ability to know oneself more definitively, to become more equipped in dealing with challenging and stressful situations, to examine thoughts and behaviors objectively, and to focus without distractions (Dufon & Christian, 2013) comprise the outcomes of mindfulness as practitioners learn to empathize with their colleagues.

Encouraging mindfulness presents an opportunity for all members in higher education to develop relationships based on caring and compassion, which are virtues that define humanity. A student who sincerely believes an educator cares for his/her success will be motivated to stay the course and even excel. On the other hand, a mindless instructor can quickly disconnect a student from the process of learning. Faculty need to engage in personal practice to be effective in teaching with mindfulness, as faculty activate engagement and focus on students through a mirroring process (Slavik, 2014), which seems unlikely if faculty are not practitioners themselves. Faculty who are involved in mindfulness are more likely to be caring, compassionate, and concerned about the success of their students; participants in mindfulness on all levels—teachers, faculty, and administrators—can contribute to a more enriched, nurturing learning community (Dufon & Christian, 2013).

The practice of mindfulness can be instrumental in enhancing teaching and learning outcomes, especially between faculty and students when these relationships are driven by care and compassion (Evans, Ziaian, Sawyer, & Gillham, 2013). Noted outcomes for practitioners involved in this contemplative focus include increased self-esteem, increased positive values, lower stress levels, and a general psychological well-being (Evans et al., 2013, p. 34). To be a fully integrated teacher requires some level of self-inquiry and introspection. The deeper one practices mindfulness, the more one is likely to understand and face head-on daily challenges with an intense focus that has the power to restore instructional vitality.

Self-efficacy. The last key in work engagement is self-efficacy, which connotes self-confidence and motivation. Perhaps the most profound consequence of practicing mindfulness is the way in which it promotes feelings of worth by allowing practitioners to be aware of negative behavior. Employees sometimes exhibit a conditioned mindset that limits the potential for personal growth and stifles room for creative options. Mindfulness demands the letting go of attachments and guarding against excessive egotistical self-involvement that can distort the quality of work. Setting high expectations for work is a positive; just as important is the awareness of impediments to achieving these expectations. Kabat-Zinn (1994) addresses the correlation between low-quality work and the effects of too much self-involvement, which can restrict the unburdening of negative conditioned behavior.

As educators learn mindful practices, they learn to root out negative behavior and achieve their full potential (Kabat-Zinn, 1994). Also clear is that practitioners exhibit self-efficacy necessary to guard against loss of self-confidence and motivation. Sherretz (2011) advances the need for mindfulness to help develop learners who are self-directed. The same can be said for faculty, whose sense of self in the workplace can be enhanced through mindful practices. After a two-month mindfulness program designed for educators, participants in one study reported positive outcomes in focus, stress, emotional well-being, and job satisfaction (Shapiro, 2015). The connection for improved vitality among educators is clear, and the same mindful practices are also needed in education, as addressed in the following section.

Mindfulness in Education

Why is mindfulness so urgently needed in education? There is more than sufficient reason to believe American education is in crisis. Based on international grading criteria, America has been outscored in the tested areas of math, reading, and science by countries such as Finland, Korea, the Netherlands, Japan, Canada, and Belgium. Results from PISA (Programme for International Student Assessment) show that compared to these and other developed countries, the US ranks 32nd in math, 23rd in science, and 14th in reading as of 2012, results which have not improved despite a decade of policies aimed at closing the achievement gap (Darling-Hammond, 2014). Short-answer responses requiring analytical thinking and higher order skills are prioritized in PISA testing; US state tests rely on lower-order skills such as recall and recognition. Students are not accustomed to PISA testing, which prioritizes analysis, synthesis, or similar higher-order thinking skills (Darling-Hammond, 2014) and instead are pressed daily to regurgitate facts, so it's no wonder that they fare poorly. Prioritizing passive memorization and disconnected facts does more than disadvantage American students on international tests. Bai et al. (2009) contend that this type of teaching and learning creates a system that treats students as "machines" that must meet external quotas of grades and awards rather than "validating their intrinsic beingness and inherent worthiness" (p. 332). Sherretz (2011) further suggests that among the other problems contributing to our national learning/teaching predicament is the general apathy of mindlessness. Since the opposite of mindlessness is mindfulness, it becomes imperative that our educators seriously rethink teaching strategies to include the concept of mindfulness.

During the last fifteen years, institutions of higher education in America and around the world have quietly implemented this alternative methodology under the banner of contemplative pedagogy. Types of reflection and introspection used in contemplative pedagogy allow students the opportunity to focus inwardly and connect with the material in the course; this kind of pedagogy incorporates both mindfulness and meditation (Slavik, 2014). Below are sections on the impact of mindfulness on emotional health, empathy, and student learning.

Mindfulness and Emotional Health

Kabat-Zinn (1994), a pioneer whose research on mindfulness spans 30 years, argues that mindful practices encourage self-inquiry and self-observation toward the end of mindful action, as it "opens channels to deep reservoirs of creativity, intelligence, imagination, clarity, determination, choice, and wisdom within us" (p. 9). Using mindfulness practices,

undergraduate students in one study attributed positive experiences to their learning and felt the resultant self-awareness enhanced their appreciation for different perspectives and fostered a greater sense of social connectedness (Song & Muschert, 2014). A study of undergraduate students who practiced mindfulness in the classroom concluded that mindfulness-based activities had a positive impact on students' ability to "transition to class, engage with the moment, engage with the learning process, attune/attend, concentrate and process information, decrease stress and anxiety, build capacity for insight and creativity, and be more reflective" (Slavik, 2014, p. 6). The benefits of mindful practice build over time, as studies show that the benefits of mindfulness are not instantaneous. Of participants with a minimum of 10,000 hours of formal practice in meditation, one study found that lasting emotional and cognitive change is possible, particularly in the ability to focus, regulate emotions, and demonstrate empathy (Davidson et al., 2012).

Mindfulness and Empathy

Seigel (2007) identifies the fourth "R" in education as self-knowledge and empathy. Under the umbrella term of social and emotional learning (SEL), which helps students develop better self-control and emotional regulation as well as improve relationships, schools have begun to see promising gains in preventing mental health issues and substance abuse (Davidson et al., 2012). A study of students who engaged in SEL showed that students who implement daily mindfulness practices are less likely to be absent and exhibit behavioral issues (Ryan, 2012). A meta-analysis of 213 studies on school-based SEL programs found that participants in such programs significantly improved their social skills, attitudes, and behavior (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

Mindfulness and Student Learning

Mindful learning consists of three qualities: a willingness to consider new ideas, an awareness of multiple perspectives, and the ability to create new categories (Langer, 1997). Specifically, mindfulness teaches practitioners that when they look at any given situation from different angles, they are more prone to view the situation in a new light, be more focused on the context of the situation by being more perceptive, and develop new classifications (Langer, 1997). Flexibility in one's thinking is central to mindful learning. Students who learn to self-regulate are able to shift away from negative states of mind and immerse themselves in positive ones, thereby positively impacting their health, academic achievement, and well-being both in the long and short terms (Grace, 2011).

The pursuit of mindfulness reinforces understanding and intelligence, the very constituents of learning. Improved standardized test scores are a by-product of mindfulness (Shapiro, 2015). Students who practice mindfulness outperform their peers who do not engage in such practices in tested areas of math and reading (Ryan, 2012). Participants in SEL programs demonstrated an 11 percentile-point increase in their academic achievement after learning mindfulness practices (Durlak et al., 2011).

From a holistic point of view, the discipline of mindfulness promotes a pedagogy that develops "student attention, emotional balance, empathetic connection, compassion, and altruistic behavior, while also providing new pedagogical techniques that support creativity and the learning of course content" (Zajonc, 2013, p. 83). Dufon and Christian (2013) suggest that the practice of mindfulness has the potential to reinforce student learning and achievement and encourage a creative environment where students become more invested in their academic career by focusing on the essentials that can define their success. Any practice that enhances student attention, promotes emotional balance, and encourages creativity can measurably increase cognitive behaviors as well.

Conclusion and Implications

The study and inquiry into mindfulness has been the basis for the grounding of universal humanity over the ages. Mindful practices have been prescribed with positive results in medicine, in the workplace, and in education. It provides a prescription for faculty vitality, which is needed to function as exemplary models for young and old minds. When faculty suffer from the loss of vitality, the domino effect is that students suffer as well, and this is unfair. However, the practice of mindfulness in teaching can be the prescriptive antidote to loss of faculty vitality; there is no doubt that such renewed and consistent energy also plays a vital role in student persistence. Instructional vitality and student learning can be improved, cultivated, nurtured, and even restored by faculty addressing the symptoms of mindlessness through the practice of mindfulness.

Contemplative pedagogy has earned the respect of time and is becoming more commonplace on college campuses as an integral part of higher education. Faculty who practice contemplative pedagogy in the classroom will find that these methods are aligned with time-honored mindful concepts. Courses using contemplative pedagogy include "first person" approaches wherein students are encouraged to connect course material with their experiences and evaluate meaning and significance from their experience (Bush, 2011). Another common practice is encouraging students to be aware in the present

moment by contemplating their own experiences about course material through discussions or in journals (Davis, 2014). Silent or guided meditation, compassion practices, and deep listening are other classroom tools (Grace, 2011). First-hand experience and inner research are the tools of investigation in contemplative practices; also important is the notion that learning builds over time. Like mindfulness practice, learning to use contemplative methods is not achievable overnight, and it demands regimented internal discipline to maintain continuity. Once the practitioner has experienced the joy and rewards of mindfulness, the rigor and discipline literally become second nature.

From a holistic point of view, the practice of mindfulness can empower faculty to excel in their craft, which is to teach, guide, coach, motivate, and redirect students; this, indeed, is an honorable calling. To create a culture bent on producing successful students, faculty must first develop a challenging and nurturing environment. Outstanding teaching is more about our overall attitude that defines our relationship with students. Our passion for our work and the love for our subject matter require a "mindful" understanding of our roles. Mindfulness means that we are watchful and take care of the mind. The following ancient words say it all about the essence of the medicine of mindfulness: "By arising in faith and watchfulness, by self-possession and self-harmony, the wise man [woman] makes an island for his [her] soul which many waters cannot overflow" (Mascaro, 1973, p. 38).

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New Learning Models and Methodologies Shaping the Future of Higher Education

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Abstract

Colleges and universities in the United States and around the world are in the midst of a transformation from traditional methods of teaching and learning. Rapid developments in technology and the changing demographics of students are accelerating the pace of change. Conversations about innovations and new ways to present content, engage and interact with students, and assess learning proliferate at professional conferences, webinars, the blogosphere, and in the higher education literature. Clear and objective information is needed in order for faculty to decide what instructional methods and educational models are most appropriate and effective for the students at their institutions. This article presents the background, impact, and future implications of popular, recent developments in higher education teaching and learning. The four learning models examined are competency-based education (CBE), massive open online courses (MOOCs), adaptive learning, and mobile learning (mLearning).

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Faculty in higher education strive to be aware of new developments in the field, new trends in instructional methods, the latest technology tools for enhancing teaching and learning, and what other colleges and universities are doing to update their programs to attract and retain students. Over the past several years, terms such as CBE, MOOCs, Adaptive Learning, and *mLearning* have appeared in the education lexicon. Before adopting competency-based education (CBE), massive open online courses (MOOCs), adaptive learning, or mobile learning (mLearning), faculty need evidence that these new methods and models effectively engage students, support improved student learning, and benefit the educational institution. This study reviews current practices and preliminary outcomes, which indicate that CBE, MOOCs, adaptive learning, and mLearning have significant potential and merit further exploration. Armed with this information, educators can move forward with greater understanding of the changing landscape of higher education and be prepared to meet the challenges of the future.

Competency-Based Education

Competency-based education has been in existence for many years, yet it is still relatively new to a majority of colleges and universities. An analysis of the background and current impact is provided along with implications for the future.

The Background of Competency-Based Education

CBE is a learning model that has been part of higher education for several decades. As far back as the mid-1970's, competency-based higher education curriculum reform initiatives were considered alternatives to the traditional method of granting college credit for course completion and time spent pursuing a degree. The competency-based curriculum aims to certify student performance that aligns with the needs of specific roles or skills in society and the workforce. As explained by Silva, White, and Toch (2015), education reformers are "seeking to make student performance more transparent in the hopes of strengthening the quality of instruction and increasing schools' and colleges' accountability for student learning" (p. 10).

There are three major approaches to competency-based education, according to Porter and Reilly (2014), who describe them as follows:

(a) a traditional course- and credit-based system, with a focus on alternative assessments such as portfolios instead of examinations; (b) a system where students progress to degree by achieving mastery of competencies, taking as little or as much time as needed; and (c) a system of prior learning assessment, where students take an assessment at college entry, such as an examination or construction of a portfolio, and are awarded course credits as recognition for their knowledge that advances them toward degree completion. (p. 3)

These three approaches are not mutually exclusive and are often combined to form a comprehensive program of competency-based education. Recognizing that spending time in class, receiving a course grade, earning college credit, and being awarded a college degree does not necessarily assure proficiency, competency-based education focuses on assessing a student's mastery of measurable learning objectives.

Competency-based education is a dramatic shift from the traditional college education because of its method of certifying proficiency and streamlining the process of completing a degree or certificate. It is a student-focused learning model where students are responsible for achieving and demonstrating mastery rather than just completing a course for a grade. The possibility of reducing the time and expense of attaining college credit to earn a degree or certification is appealing to students as well as to the institutions. However, establishing the standards and criteria that determine proficiency makes competency-based education challenging to implement. Since competency-based education focuses on observable and measureable

behaviors and performances, it is subject to the criticism that it overlooks less quantifiable attainment of knowledge and understanding.

The Impact of Competency-Based Education

How well does the promise of competency-based education achieve its goals of increasing degree completion and lowering costs? To date, there are very few reports with data that validate competency-based education's impact on increasing college access, student learning, and degree completion. Cost savings to students can vary depending on factors such as the nature of the program and the pace of program completion (Porter & Reilly, 2014). For institutions, the startup costs for establishing the instructional and assessment infrastructure as well as the ongoing costs in delivering their competency-based degree programs may diminish any cost savings. Whether the competency-based degree program and its faculty are structured as a separate stand-alone unit or integrated into an existing university department may also impact the costs.

With regard to the impact of competency-based education on student learning, evidence is limited to assessment of outcomes at the elementary and secondary education levels. Research data indicate improvement in K-12 students' reading scores, school performance indices, reduced number of discipline issues, and less teacher turnover (Sheehy, n.d.). Impact on student learning at the post-secondary level has not been adequately addressed because there is no consistent or widely adopted method of measuring learning for competency-based methods in higher education.

Despite insufficient research on the benefits to higher education students and their institutions, the number of competency-based postsecondary degree programs continues to rise. There are numerous articles that describe and promote this growth (Fain, 2013; Offerman, 2012) without answering the important questions surrounding whether these programs are meeting the goals of increased access, reduced costs, and higher degree completion rates.

The Future of Competency-Based Education

An increase in the number of colleges and universities embracing the competency-based education model can be expected as the traditional credit hour undergoes redefinition and the seat-time model for earning college credit is reexamined. Contributing to this expansion is the recent U.S. Department of Education decision that removed a major barrier by allowing financial aid eligibility for students enrolled in competency-based education programs. Other challenges are being addressed. The National Institute

for Learning Outcomes Assessment report (Klein-Collins, 2013) identified several of these challenges, such as (a) “building faculty support,” (b) “identifying principles of good practice,” (c) “managing expectations about degree completion,” (d) “working with regional accrediting bodies,” and (e) getting a better understanding of the kinds of assessments being used” (p. 13).

Based on the analysis of the factors driving CBE, the competency-based education model of focusing on students’ knowledge and skills and validating their mastery of course material with consistent measures of student learning will most likely become more commonplace within the next five to seven years. With less emphasis on the traditional class seat time and credit hour and the ability to certify these competencies, higher education institutions will be empowered to ensure the quality of the degrees they offer to students, their families, and to employers.

Massive Open Online Courses (MOOCs)

An analysis of the origins of the MOOC movement and its uneven performance as an effective learning model are presented, as well as insights into the future role of MOOCs in higher education institutions.

The Background of Massive Open Online Courses

Massive Open Online Courses, commonly referred to as MOOCs, made headline news throughout the United States and the world when Stanford University offered its Artificial Intelligence MOOC in 2011. MOOCs represented the next step in the evolution from accessing open educational resources to accessing to free online courses (Mazoue, 2013). The concept behind MOOCs was to produce a cost-effective, desirable educational outcome through online courses developed for the masses. The initial goals for institutions of higher education designing MOOCs and integrating these courses into their academic initiatives began, essentially, with six critical concepts, which were

- to extend the reach of the institution and access to education;
- to allow institutions of higher education to build and maintain a brand;
- to improve economics through reducing costs or increasing revenue;
- to improve educational outcomes;
- to provide innovation in teaching and learning; and
- to create greater opportunities for research on pedagogical strategies, student engagement, and motivation (Hollands & Tirthali, 2014).

According to Hollands and Tirthali (2014), the first goal — to extend the reach of the institution and access to education—was the most frequently stated purpose for offering a MOOC, mentioned by 65% of the institutions surveyed. With MOOCs, institutions saw the potential for an increase of access to professors to large, global audiences, the flexibility for students in place of study and time, the inexpensive cost and minimal risk to the student population, the adaptability for students to design their own programs of study utilizing several courses from various institutions, and the call for working adults seeking professional development activities. Moreover, the second goal, according to Hollands and Tirthali (2014), was to allow institutions of higher education to build and maintain a brand, which has served to attract and retain students at some schools. Likewise, the third goal, which was to improve economics through reducing costs or increasing revenue, was mentioned by 38% of the institutions. The concept for MOOCs to potentially save costs for institutions has relied heavily on the re-use of MOOCs and their materials multiple times, shared materials between professors, more efficient student recruitment, reduced costs for student support services, and a reduction in the need for facilities.

Furthermore, in the report by Hollands and Tirthali (2014), the fourth goal — improving educational outcomes — was identified by institutions as being able to create strategies that allowed instructors to re-imagine their pedagogy, re-create their courses with new and motivating lectures and instructional materials, provide for instantaneous commentary to students, and garner modes of personalization and adaptive learning for students. The fifth goal — to provide innovation in teaching and learning — has allowed faculty to experiment with the content of their courses and to provide students with more tangible, measureable educational outcomes. The final goal of MOOCs was to create greater opportunities for research on pedagogical strategies, student engagement and motivation, as well as to advance the role of social media networks in teaching and learning (Hollands & Tirthali, 2014).

The Impact of Massive Open Online Courses

Just over four years ago, educators who were the most optimistic and enthusiastic advocates for Massive Open Online Courses believed that MOOCs had the potential to dramatically change the existing model of higher education. The innovative and technological advancements of MOOCs “promised to deliver top-tier teaching from institutions like Harvard, Stanford, and MIT, not just to a few hundred students in a lecture hall on ivy-draped campuses, but free via the Internet to thousands or even millions around the world” (Pope, 2014, para. 1).

Recently, however, the general enthusiasm for MOOCs as seen early on has declined rapidly, and the original hype has begun to fade. The impact of MOOCs on higher education seems to have been short-lived. In fact, figures released in early 2015 document this shift. Kolowich (2015) reported that just two years ago, in 2013, 28% of respondents believed MOOCs were sustainable, while 26% thought they were not. Now, in 2015, just 16% believe MOOCs are sustainable, while 51% think they are not (Kolowich, 2015). Despite this drop in support for MOOCs, they have had an impact on producing new insights in regard to research on online teaching and learning; and for some institutions, MOOCs have created increased visibility and student recruitment.

The Future of Massive Open Online Courses

Today, few people would agree that MOOCs, as a whole, created the grand impact on the future of higher education as originally predicted. MOOCs have not proven to be substantial sources of revenue nor effective as cost-cutting approaches to instruction. At the same time, there is little doubt that online education, and even MOOCs to a lesser degree, are here to stay. Large players in the for-profit sector of higher education like DeVry University and the University of Phoenix, for example, continue to delve deeper into the teaching and learning process of online education and explore the benefits online education has on their student population. So, although MOOCs may not have risen to the grandiose claims of their creators, they will remain in higher education — until, of course, the next big thing comes along.

Adaptive Learning

An objective analysis of adaptive learning and its impact on student learning is presented along with implications for the college classroom of today and tomorrow.

The Background of Adaptive Learning

With the growth of computer technology and database capability since the early 2000s, adaptive learning has become a new learning model that customizes instruction based on an individual student's level of mastery. The potential of adaptive learning has seen growing interest among educators and has garnered greater awareness in recent years due to the attention from the Bill and Melinda Gates Foundation. While the term *adaptive learning* is often used interchangeably with the term *personalized learning*, it should be noted that personalized learning is the umbrella category under which adaptive learning is one technique. Adaptive learning "takes a more sophisticated, data-driven, and, in some cases, nonlinear approach to instruction and remediation" (Newman, 2013, p. 7). An adaptive learning method adjusts to each student's

level of performance and presents the appropriate level of instruction, content, and resources needed to make progress at each point along the learning continuum.

Adaptive learning is both a concept and a tool. Fleming (2015) indicates that adaptive learning creates individualized learning, provides automated teaching, and addresses higher education's greatest obstacles — cost, access, and quality. Adaptive learning helps meet students' needs and abilities through the customized content delivery, assessment tools, and emphasis on mastery of information. Although these approaches are not new, the game changer has been through implementation of technology with "automated digital learning platforms driven by predictive modeling, learning analytics, and the latest research in brain science, cognition, and pedagogy" (Fleming, 2015, para. 4).

Moreover, adaptive learning is less dependent on faculty engagement and in-person instruction because it utilizes pre-programmed instruction that is delivered in formats that are highly scalable. The faculty member often becomes more of a coach, taking on a supportive role in the student's learning process. Advocates of adaptive learning point to its use of analytics to improve the quality of education and provide greater access for learning to students while cutting academic costs.

Adaptive learning also supports faculty, as the process allows instructors to customize instruction to students who may have very different learning needs. For example, in any given classroom, a teacher may have a bored student, a quiet student, and an unmotivated student. Through the use of adaptive learning, the instructor can offer more rigorous and engaging material; and the new content, then, can aid in redirecting a student's boredom into an energized, positive learning experience. Likewise, adaptive learning can aid the quiet student in need of an instructor's attention by providing academic content which focuses the student on lively, appealing material. For the unmotivated student, adaptive learning, similarly, can specifically challenge her by pulling her out of her comfort zone and raising her proficiency in a particular subject (D'Auria & Mucha, 2014).

The Impact of Adaptive Learning

Throughout higher education in the United States, experts believe that adaptive learning has tremendous potential because it promises to boost the rates of student retention and graduation through its ability to tailor coursework and support to students. The benefits of the use of technology within adaptive learning become more apparent when implemented across a larger number of students, according to Fain (2014). Widespread adoption of adaptive learning enables the

institution to gather more data about its effectiveness and can help to achieve a return on the investment in the technology. Fain (2014) also reported that more for-profit institutions of higher education have begun to plan expansive adaptive learning projects. Although some in higher education are skeptical of the effectiveness of adaptive learning in classrooms, for-profit institutions, given their corporate business structures and decreased faculty voice in shared governance, can experiment to a greater degree with adaptive learning (Fain, 2014).

Overall, adaptive learning has made a remarkable impact on higher education because, for many institutions, it is simply a sound investment. The utilization of an adaptive learning model helps students in three primary ways—it ensures that the learning process improves educational outcomes, the instructional materials are focused and streamlined to meet the student's needs, and the learning is individualized and interactive (Lui, 2015).

The Future of Adaptive Learning

Adaptive learning, particularly in higher education, has enormous potential as technology continues to grow and advance. For example, Knewton, an adaptive learning company that has developed a platform to personalize educational content and is a leader in the field of adaptive learning, is primed to create and market “a learning profile for every student...that travels from school years to college and onto employment” (Webley, 2013, para. 3). The learning profile would provide a dynamic description of the student's learning styles along with individual learning strengths and explanation of the type of instructional support that has been effective in addressing specific learning needs.

Although Knewton's ideas for adaptive learning technologies sound promising for today's students, Feldstein (2013) believes educators should be enthusiastic about the possibilities but should also remain cautious and understand that adaptive learning systems are just tools that have potential if they are understood and employed appropriately.

Adaptive learning appears to have a sturdy grip on every level of education today in the United States. Newman (2013), however, advises educators and their institutions to carefully evaluate the various adaptive learning approaches and “put these tools to work in the context of closely monitored experiments complemented by rigorous evaluation” (p. 16).

The proliferation of adaptive learning technology and commercial suppliers of adaptive learning platforms will continue to create opportunities for partnerships with higher education. Faculty who are well informed about the potentially significant benefits of adaptive learning are comfortable collaborating with the adaptive learning solution providers, and understand how to integrate the adaptive technologies to enhance student learning will be the major drivers of its adoption for teaching and learning.

Mobile Learning

The proliferation of mobile devices for personal and professional use has led to increasing popularity of applications for teaching and learning. The background of mobile learning and its impact are presented, along with implications for the future.

The Background of Mobile Learning

It is interesting to note that the history of mobile learning (mLearning) began back in 1968 when the American computer scientist Alan Kay at Xerox developed the first portable, book-sized computer for education, called the Dynabook. Although it never went into production, it laid the groundwork for today's laptop computer. Another significant milestone in the evolution of mobile learning occurred when Palm released the PalmOS in 1996 with its learning and organizational software. A major project to explore mobile education was launched in 2001, the Mobile Learn Project, funded by The European Commission (Hylén, 2012).

In 2005, handheld or palmtop technology started to gain popularity for its usefulness as a personal electronic device for communication and access to information. For the first time, these devices removed the limitations of a fixed physical workstation or seat in the office, library, or classroom. But it was the introduction of mobile tablets with the first Apple iPad in 2010 that launched the use of convenient mobile devices for teaching and learning. One of the first universities to experiment with iPads as a classroom learning tool was the Faculty Learning Community (FLC) at Purdue University Indianapolis. In the academic year 2010-2011, the FLC incorporated iPads into classroom learning activities, such as concept-mapping and graphing, and also for performing learning assessment as well as research support and communication (Rossing, Miller, Cecil, & Stamper, 2012).

The capabilities and power of wireless technologies are continuously being expanded, and there exists today a wide array of mobile devices and apps that can be used for learning: smartphones with their built-in cameras and video recorders, GPS, tablets, iPods, laptops, netbooks, Chromebooks, and e-readers.

The Impact of Mobile Learning

The powerful features of today's mobile devices have made them nearly indispensable to people around the world. In fact, the statistics about mobile device usage indicate that it has overtaken fixed Internet access (Bosomworth, 2015). The portability, flexibility, ease of use, and convenience contribute to their widespread adoption for not only personal and business use, but also education.

In a study by Ooms, Linsey, Webb, and Panayiotidis (2008), mobile devices were found to be effective learning models for promoting greater student-student and student-instructor interaction and feedback. Other advantages of mobile devices are for providing lectures and learning materials that students can access any time and any place. By extending the learning environment beyond the university classroom walls, students have the opportunity to become more independent and responsible for their learning. The mobile learning model, however, goes beyond watching recorded lectures, taking tests on their tablets, participating in online class discussions or texting classmates and instructors. The world is at the students' fingertips through the connectivity, sharing, and engagement as a community of learners.

The impact on the typical university classroom of implementing a mobile learning model has been made possible by the huge number of applications for teaching and learning. Examples of the transformative possibilities for the college curriculum are (a) interactive real-time classroom polling to engage students through mobile student-response systems for the smartphone, laptop, or tablet; (b) note-taking and fieldwork that enable students to capture images, audio, video, record GPS coordinates, explore augmented reality features, translate languages, and organize and share notes; and (c) creation of individualized study aids such as digital flashcards and quiz or test study preparation tools. There are thousands of new mobile learning applications that can enhance the traditional college curriculum, promote student engagement, and provide authentic hands-on learning experiences.

The Future of Mobile Learning

The pace of the development of new mobile technologies appears to be gaining momentum. In order for mobile learning to become a successful component of the curriculum, educators must be prepared to use these technologies effectively and to continuously adapt to the new devices and applications. Instructional activities and assignments conducted using mobile devices need to be designed so that students remain focused and not distracted by the personal use of their devices.

Students and faculty own a variety of mobile devices, and the increase in BYOD (Bring Your Own Device) presents challenges to the university for compatibility of different systems, availability of resources for connectivity, and possible security risks for the wireless network (Brown & Mbatia, 2015). However, the advantages of mobile devices as tools for teaching and learning will continue to outweigh the challenges of adoption. The opportunity for mobile learning to create resource-rich collaborative learning environments along with the increase in robustness of wireless infrastructure is very promising. Also on the horizon are new developments in wearable technologies that have the potential for unlimited, seamless, and ubiquitous learning.

Conclusion

The objective analysis presented of competency-based education (CBE), massive open online courses (MOOCs), adaptive learning, and mobile learning (mLearning) has shown that higher education is in the midst of a transformative period of innovation and experimentation with new learning models and methodologies. Higher education faculty and their leaders in higher education need to be aware of these new developments and begin strategizing about their usefulness and appropriateness at their institutions. More research is needed to assess their impact on student learning outcomes and education quality.

Competency-based education, MOOCs, adaptive learning, and mobile learning are often characterized as disruptive forces; yet, upon closer examination, many in higher education believe these innovative approaches offer the opportunity to rethink and redesign the traditional learning paradigm. Educators who have an understanding of how and why these approaches originated, how they are currently being implemented, and what the future might hold will be better prepared to assess the latest developments and to continue the conversation about the usefulness, effectiveness, and appropriateness of new learning models and methodologies for students and faculty at their institutions.

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Solving the Problem of Solving Problems

Fogler, H., LeBlanc, S., & Rizzo, B. (2013). *Strategies for creative problem solving* (3rd ed.). Upper Saddle River, NJ: Prentice Hall. ISBN: 978-0-1330-9166-3, 356 pages, \$59.

Gabrielle Bonner Smith
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Reviewer Note: Gabrielle Bonner Smith, College of Liberal Arts & Sciences, DeVry University, online.

Strategies for Creative Problem Solving is the third and most impressive work of the writing duo of Scott Fogler and Steven LeBlanc. Benjamin Rizzo has now joined the team, and the threesome continues to demonstrate their proven method for approaching industry and everyday problem solving using “technical” methods in creative ways. The proof of the work’s significance was its 1996 selection by the American Society of Engineering Education as the recipient of the Merriam-Wiley Distinguished Author Award. Since then, Fogler, LeBlanc and Rizzo have continued to develop and improve their winning formula. The trio’s ability to see a much larger field of application of their theories is what gives this newest edition added value and significance. They argue that not every problem requires its own strategy; instead, they show how existing solutions can prove to be versatile when applied creatively under the right conditions.

Having improved on the organization and flow of the previous two editions, this third offering is organized as a curriculum in and of itself. Each of the 12 units acts as a module detailing and illustrating the time-tested Fogler-LeBlanc-Rizzo system. From the building blocks of the Heuristic mindset and the authors’ five-step problem solving method, each unit contains background information, exercises, and real-world accounts of how that particular tenet has been and can be applied. The examples are not only specific to engineering problems but also the challenges of everyday life, even including how to select an appropriate holiday gift. The text employs a wide array of sources, from websites to blogs, journals, textbooks, and even case studies. The authors do an impeccable job of documenting the sources and suggesting additional reading for each unit. Although the methodology mainly centers on

what Fogler, LeBlanc and Rizzo have developed, it also features the Kepner-Tregoe problem solving system. The organization is consistent from start to finish and appeals to various learning styles with the inclusion of illustrations, diagrams, and a companion website. The ease of translating the content from the classroom to the real world is detailed to the letter. Additionally, the size of the book is slightly larger than the previous editions, giving it more room for margin notes.

The addition of a well-organized companion website certainly complements the work. It includes not only the customary summary notes, Microsoft PowerPoint slides, and instructor resources, but also user-friendly, interactive modules for each unit.

If there is a weakness to the book, it’s not in the work itself but rather the association and its perception of it. The authors have long been associated with engineering, and thus engineering schools and their students may believe that the scope of this work should be “confined” there. However, there have been some adoptions of a critical thinking curriculum that might now make it suitable to other disciplines. These new tenets are apropos to almost any industry or field and would be a great work to consider for cross-curriculum initiatives.

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CALL FOR PAPERS, JUNE 2016 ISSUE

For the June Journal, we continue to solicit scholarly articles (3000 to 5000 words) that have not been published elsewhere but are “working papers.”

Papers of all types are welcome including theory papers, empirical or case studies, methodology papers, literature reviews, and the like, from both positivist and naturalistic traditions. We would prefer papers that emphasize practical relevance that resonate with our readers, though papers must be research-based. Also, please note that these submissions will be considered “working papers” that can be submitted to other journals.

Each submission will be coded before being sent for review. Submissions will go through a blind review by two peer reviewers (thanks to all the faculty who have volunteered to help with this in their area of expertise). Final selection of articles for this edition will be made by the editorial board.

There are two templates to be used for submission along with two APA reference source materials. They are available through the DeVry Commons intranet community site, DeVry University Journal of Scholarly Research:

- Guide to APA Research Writing and Formatting Template Revised Nov 2013
- Guide to APA Research Writing and Formatting Revised Nov 2013
- DeVry University APA Handbook
- APA 6th Guide to Citing Sources

Submission deadline is Monday, February 1, 2016.

Authors who have previously submitted papers for past issues are encouraged to re-submit their revised papers. Papers should be sent with an additional document that includes comments showing how reviewers' and editors' feedback was addressed.

All papers and reviews can be submitted to Managing Editors Sarah Nielsen and Deborah Helman, via the following email address: **DUJOSR@devry.edu**

We are very proud that we continue to have this venue for promoting and highlighting our faculty's scholarship.

CALL FOR BOOK REVIEWS, JUNE 2016 ISSUE

For the June Journal, book reviews continue to be a regular feature. Under the direction of Dr. John Morello, colleagues may submit reviews of both fiction and non-fiction work that adhere to the following publication guidelines:

1. Reviews should be between 500-1000 words in length, double spaced and include the following: author, title, place of publication, publisher, year, price, page length (including introduction and text) and International Standard Book Number (ISBN).
2. Reviews should include a brief summary of the scope, purpose, content of the work and its significance in the literature of the subject. They should evaluate the strengths and weaknesses of the work and also pay attention to the use of sources (including documentation), methodology, organization and presentation.
3. Reviews should be fair, balanced and treat authors with respect.

Book Review submissions will observe the same deadline as paper submissions: February 1, 2016.

Submissions should be sent to the Managing Editors Sarah Nielsen and Deborah Helman via the following email address: **DUJOSR@devry.edu**

The editors reserve the right to edit reviews in terms of length and tone and will request a signed permission form to permit use of the review.

Book reviews are an important part of scholarly life. They alert colleagues to new developments in the academy, foster discussions that can lead to new scholarship and ultimately provide us with both a broader and deeper view of the world, which we in turn can share with our students. We are pleased to include the book reviews as a feature and enjoy the insightful, healthy and lively debate the reviews produce.

CALL FOR LETTERS TO THE EDITOR, JUNE 2016 ISSUE

A Letters to the Editor section will be incorporated if there are submissions. Colleagues who would like to respond to or comment on an article or book review that has been previously published should submit their letter using the email address above. The following criteria will serve as broad guidelines for these letters:

1. Letters should identify the month and year of the article/review being commented upon. The full title of the article or review as well as the author/s should be included. Letters should be double-spaced and be under 500 words in length.
2. Just like book reviews, letters should be fair, balanced and treat authors with respect.

CHAMADA DE ARTIGOS, EDIÇÃO DE JUNHO DE 2016

Para a edição de junho do *Journal*, nos continuamos a solicitação de artigos científicos (3000 a 5000 palavras) que ainda não foram publicados em outros periódicos e que constituam “trabalhos em andamento”.

Trabalhos de qualquer tipo são bem-vindos, incluindo trabalhos teóricos, empíricos ou estudos de caso, papéis de metodologia, revisões de literatura e demais, tanto de tradições positivistas quanto naturalistas. Nós preferiremos trabalhos que sejam relevantes a prática de nossos leitores, não deixando de lado o fato de que devem ser baseados em pesquisas. Também entendam que estas submissões serão consideradas como “pesquisas em andamento” o que não impede sua publicação futura em outros periódicos.

Cada submissão será codificada antes de ser enviada para a revisão. As submissões passaram pelo método de revisão às cegas (*double blind review*) por dois colegas revisores (agradeço a todos os professores que se voluntariaram para esta tarefa emprestando seus conhecimentos). A seleção final dos artigos será feita pelo conselho editorial.

Existem dois formatos que devem ser usados para as submissões, bem como duas fontes de formatação própria – APA.

Elas estarão disponíveis através da comunidade Commons DeVry, na intranet do DeVry University Journal of Scholarly Research, bem como no próprio *academus* no link *pesquisa*:

- Guide to APA Research Writing and Formatting Template Revised Nov 2013
- Guide to APA Research Writing and Formatting Revised Nov 2013
- DeVry University APA Handbook
- APA 6th Guide to Citing Sources

A data limite para as submissões é dia 2 de Fevereiro de 2016.

Encorajamos os autores que submeteram trabalhos para edições anteriores a submeter novamente seus trabalhos. Estes trabalhos devem ser enviados com um documento adicional com os comentários que demonstrem como de recebeu o feedback de seus revisores e editores.

Todos os artigos devem ser enviados para as Editoras Chefes Sarah Nielsen e Deborah Helman através do endereço eletrônico abaixo: **DUJOSR@devry.edu**

Estamos muito orgulhosos de continuar com esta empreitada e por promover e destacar a qualidade acadêmica de nossa equipe.

Nesta edição do *Journal* serão aceitas submissões de artigos em língua portuguesa. Caso o autor decida submeter seu trabalho em Português, deverá fazê-lo dentro da formatação oficial do *Journal* até o dia 2 de Janeiro, para que exista tempo hábil para que se possa proceder com a sua tradução. Os arquivos enviados em Português serão analisados e traduzidos. A submissão em português autoriza automaticamente seu processo de tradução e a publicação do artigo em sua versão em inglês com os devidos ajustes. Sua publicação estará condicionada pelos processos de tradução e revisão necessários.

Papers in Portuguese will be accepted for this next *Journal* issue. Submissions in Portuguese must abide by the same formatting rules as the papers in English, and must be submitted before January 2nd, 2016, so that there is enough time for the necessary revisions and translations. Papers submitted in Portuguese will be analyzed and translated. Submissions in Portuguese automatically authorize both its translation and publication in English with the necessary modifications. Articles submitted in Portuguese will be translated to English and then revised.

CHAMADA DE REVISÕES DE LIVROS, EDIÇÃO DE JUNHO DE 2016

Para a edição de 2016 do periódico, as revisões de livros continuarão como parte regular do mesmo. Sob a direção do professor Dr. John Morello, os colegas devemos submeter revisões tanto de trabalhos de ficção e não ficção que tenham aderência às seguintes recomendações:

1. As Revisões devem ter entre 500 e 1000 palavras, espaçamento duplo e incluir: nome do autor, título, local de publicação, editora, ano, preço, número de páginas e o International Standard Book Number (ISBN).
2. As Revisões devem incluir um rápido resumo da abrangência e proposta, conteúdo do trabalho e seu significado na revisão da literatura da temática. Elas devem avaliar os pontos positivos e negativos do trabalho e ter atenção para o uso de referências (incluindo documentações), metodologia, organização e apresentação da obra.
3. As revisões devem ser justas, balanceadas e tratar os autores com respeito.

As revisões de livros devem observar a mesma data limite que os artigos: 01 de fevereiro de 2016.

As submissões devem ser enviadas (em inglês) para as Editoras Chefes Sarah Nielsen e Deborah Helman através do endereço eletrônico abaixo: **DUJOSR@devry.edu**

Os editores reservam os direitos de revisar e editar os termos, cumprimento e tom e vão requerer uma permissão escrita para o uso da revisão.

As revisões de livros são uma parte importante da vida acadêmica. Elas alertam os colegas sobre novos desenvolvimentos na academia, fomentam discussões que podem levar a novos desenvolvimentos e ultimamente fornecem uma visão mais ampla e aprofundada do mundo, que por sua vez pode ser compartilhada com nossos alunos. Nós estamos satisfeitos em poder incluir as revisões de livros como parte integrante e interessante, saudável e de debates vivos que produzirem.

CHAMADA DE REVISORES E TRADUTORES

O DeVry Journal abre a partir desta data submissões de candidatos a revisores e tradutores dos artigos que serão publicados em sua próxima edição. As candidaturas devem ser apresentadas até o final do mês de Dezembro, via E-mail, para **aneto7@fbv.edu.br** com a cópia de seu currículo lattes anexa.

São requisitos para a candidatura como revisor (peer reviewer):

1. Ser docente em tempo parcial ou integral de uma instituição do grupo DeVry no Brasil;
2. Ter fluência em Português e Inglês;
3. Ter título de Mestre ou Doutor;
4. Ter a disponibilidade para responder e emitir parecer sobre o artigo dentro de duas semanas após o recebimento do arquivo para análise.

São requisitos para a candidatura como tradutor:

1. Ser docente em tempo parcial ou integral de uma instituição do grupo DeVry no Brasil;
2. Ter fluência em Português e Inglês;
3. Ter título de Mestre ou Doutor;
4. Ter a disponibilidade para responder o arquivo com sua tradução duas semanas após seu recebimento.

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