DEVRY UNIVERSITY JOURNAL OF SCHOLARLY RESEARCH

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DeVry University
Keller Graduate School of Management

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TABLE OF CONTENTS

ARTICLES:

PAPERS FROM THE COLLEGE OF LIBERAL ARTS & SCIENCES

PAPER FROM THE COLLEGE OF ENGINEERING & INFORMATION SCIENCES

FROM THE CLASSROOM:

BOOK REVIEWS:

CALL FOR PAPERS:

A MESSAGE FROM THE PROVOST AND ASSOCIATE PROVOST

As we embark on our 87th year at DeVry University, we are proud to share the fourth volume of the DeVry University *Journal of Scholarly Research*. Scholarly activity continues to be an important role for our faculty at DeVry University and its Keller Graduate School of Management. The work presented in this edition is a testament to our professors' dedication to their individual fields of study and those of interest to the university as a whole.

We are equally pleased to present the initial scholarly activity pertaining to our distinctive learning approach – TechPath. In this issue, you will find work by our faculty in this area, including:

- *Literary Matters in Technical Contexts*, by Dr. Judy McCarthy and Dr. John Morello
- *A Lecture to Teach Generic Programming at an Advanced College Programming Course: A Case of Visual C++*, by Dr. Penn Wu
- *The Factoring Flowchart: A Problem-Based Learning Tool for Factoring Polynomials*, by Kyle Muldrow

Through our professors' dedication to scholarly work, our commitment to transform learning will continue to evolve. We look forward to presenting thought-provoking work in future journals as we continue to evolve "*DeVry TechPath*".

Shantanu Bose, PhD
Provost, DeVry University

Darryl Field, PhD
Associate Provost – Academic Operations

A MESSAGE FROM THE NATIONAL DEAN

As we embark upon a new year, there is an extraordinary opportunity to move the field of teaching and learning forward. While we are experiencing one of the strongest hiring markets for college graduates, employers are still not granting graduates a "free pass." (Gardner, 2018) The labor market and skill sets needed for today's college students continue to evolve at a rapid pace – fueled by technology. Modernizing learning to prepare students for the future becomes critical and central to our faculty community and our University at large.

As the workplace becomes expeditiously digitized, so do our classrooms. DeVry University provides a modern experience – focused on hands-on experiential learning. Modern learning is deeply rooted in real-world application and problem solving so both faculty and students collectively solve the complex problems of today's digitized workplace.

We are proud of the anagogical practices our faculty have embraced to transform our classrooms, along with the scholarly research that has transpired in this area. This issue of the DeVry University *Journal of Scholarly Research* focuses on some initial advances of what we all refer to as "TechPath," a distinctive approach to teaching and learning – focused on People, Process, Data, and Devices.

This journey has just begun and so has the series of scholarly research focusing on "TechPath." Buckle in as we continue to transform teaching and learning!

Lynn Marie Burks, PhD
National Dean, Faculty

A MESSAGE FROM THE MANAGING EDITORS

We would like to extend a very warm welcome to the latest issue of the DeVry University *Journal of Scholarly Research*; Vol. 4, No. 1.

This issue contains papers from across the university. Among the papers we have included a spotlight is focused on the humanities and STEM debate. Additionally, we have a political science paper within this issue and a paper that focuses on increasing the effectiveness of teaching advanced programming to Computer Information Science students. We are very happy to include two "From the Classroom" papers that provide observations that resonate with all faculty.

We would like to thank all of our contributors and the DUJOSR board for their enthusiastic and generous contributions. We would particularly like to acknowledge and thank our Liberal Arts and Sciences (LAS) editors Judy McCarthy and John Morello, who are stepping down from their editorial roles, and who as part of the founding group of faculty have forged and shaped this publication, and, who without stint have shared insights, talent and good humor. We welcome Michael Gooch to the editorial board as our new LAS editor.

As we expand and enhance the TechPathway of our university's course offerings, the DUJOSR provides a perfect forum for discussion and exchange of ideas that enhances such a strategy.

Sincerely,

Deborah Helman, PhD
Managing Editor

Michael Bird, PhD
Managing Editor

DeVry University
Keller Graduate School of Management

DEVRY UNIVERSITY JOURNAL OF SCHOLARLY RESEARCH

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The *DeVry University Journal of Scholarly Research* (ISSN 2375-5393 1) is a semi-annual, multi-discipline, peer-reviewed journal devoted to scholarship and education research.

MANUSCRIPT SUBMISSIONS INFORMATION

The journal welcomes unsolicited articles, case studies, reviews, and letters on scholarship, education research or related subjects. Text and citations should conform to APA style as described in the *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*

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

PEER REVIEWERS FOR THIS ISSUE

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

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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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LITERARY MATTERS IN TECHNICAL CONTEXTS

JUDY McCARTHY
JOHN MORELLO
COLLEGE OF LIBERAL ARTS & SCIENCES

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ABSTRACT

"Why study literature?" is a legitimate question frequently asked by students, particularly in Science, Technology, Engineering, and Mathematics (STEM) contexts. This paper introduces the problem from student perspectives, particularly nontraditional students in business and technical contexts taking a literature course online, and then defends the study of literature as leading to a) original, critical mind development; b) precision in academic-scholarly research related to literature, but exportable to other areas of academic inquiry; c) opportunities to create original literature; d) immersive moral-ethical thought that is both cognitive and psycho-social; and e) transcendent intelligence, multiple intelligences, and ways of knowing and experiencing the world that are self- and society-transforming. A brief analysis of emotivism and some literary applications are offered, and the paper concludes with notes toward the modern study of literature in technology-rich contexts.

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Keywords: literature, literary study, critical thinking, creative writing, multiple intelligences, emotivism

THE STUDY OF LITERATURE FROM A STUDENT PERSPECTIVE

Nontraditional students, who may be first-generation college attendees, older, with families, jobs, and (frequently) language-skill deficits face an array of issues in studying literature. Motivated by career paths that ensure employment and incomes, they typically have low interest in literature. They express boredom when reading, and poor training in high school has led to a lack of preparedness, fear, and general cognitive dissonance when asked to interpret, analyze, or make sense of a poem or fictional narrative at any level, even at its surface. Here is a sampling of students reacting to the concept of reading and discussing literature:

> Story telling was never something that I was good at, being creative was never a gift I had nor developed (*Jenn, personal communications, October 25, 2016*).

> I never imagined that I would be the first of my family to graduate high school and go to college. It was a difficult transition. I had to juggle helping out my family and setting time aside for school and work. This was not an easy task and in the beginning it seemed impossible. I struggled and it started to show. I stressed and it started to show (*Jesus, personal communications, October 25, 2016*).

> Not to cause any issues but personally I have never thought of literature as something that was to be or needed to be studied. To me reading and writing can be pastimes and when thought of as something to study it becomes work and work isn't fun like reading is (*Jesse, personal communications, October 29, 2016*).

> I think I also struggle with stories and poems that were written so long ago because of the language they used was different than our own. It is hard for me to put myself in that time period and understand what the writer is thinking (*Lisa, personal communications, November 3, 2016*).

> I always have the hardest time finding the symbolism within a piece of literature. I am someone who reads a story and just picks up on everything on the surface. All of the symbolism is hard for me to read or if I am searching for symbolism I may pull the wrong things out. How can I improve this skill? (*Robert, personal communications, November 6, 2016*).

Literature courses in STEM contexts also suffer because students, quite understandably, fail to see the relevancy of such courses. After all, will anyone pay them to write poetry? Faculty as well have not been particularly good apologists for literary study, traditionally. Nevertheless, there are intellectually sound reasons for not only continuing to study literature, but to deepen and broaden its study immersively, so as to develop what Northrop Frye (1965) called, "the power of utterance" (p. 47), a power which is sociological, political, and personal, as well as linguistic. Finally, there are practical reasons for studying literature related to critical thinking, analyzing and organizing thought, conducting academic research, presenting work in prescribed formats, developing nascent creativity, and nourishing multiple intelligences, not the least of which is moral-ethical intelligence.

ANALYZING A TEXT AND THE ORIGINATIVE CRITICAL MIND

All too often, students in STEM contexts are encouraged to locate answers, rather than originate meaning. Students in courses exclusively interested in information gathering, data, processes, and describing or reporting these enjoy an education that suggests fixed answers and satisfaction based on finding and conveying fixed answers. If asked to factor polynomials, for example, students may locate or memorize a process. However, if asked to interpret a poem, a story, a memory, or even an ambiguous word, students frequently draw a blank. This "blank" may be expressed as anxiety – "what if I'm wrong?" It may also be muddled with previous school memories of having been judged, thought stupid, or ridiculed. Everyone, even professional literary critics, draws this same "blank" if unpracticed in the art of interpretation. Interpretation requires the subjective mind in contemplation of an abstract object (word, poem, story, or memory) to literally invent a bridge between the two, a bridge which has no other existence than that created by thought. The mind engaged is this activity experiences the world very differently from the mind that hunts for the "right" answer.

Students are legitimately concerned about appearing foolish. For although interpretation is neither right nor wrong (as bright students are exceedingly fond of reminding faculty), there are more or less sophisticated interpretations, qualitatively different interpretations, more or less supportable and persuasive interpretations. And the mind accustomed to being "right," encouraged by a fact-finding education, wishes understandably to offer an approvable interpretation. The anxiety of literary interpretation cannot be underestimated, and it is no wonder that so many students reject the project outright in a sour-grapes mentality: "I'm not good at this, and this is irrelevant."

Such students may not be able to offer any interpretation at all. They may appear stuck on the concrete objects at the surface of a poem, such as Frost's (1923) "Stopping by Woods on a Snowy Evening," a poem that offers a

quaint surface charged with very different and darker underlying possible meanings. At first, students may only be able to summarize the poem or talk about the nouns: "woods," "house," "village," "snow," "horse," "bells," and the like. They initially find the poem light-hearted and homely because the nouns are benign and the tight rhyme and meter lend a sing-song, nursery-rhyme quality. The suggestion that the poem's persona contemplates death or suicide by hypothermia often seems incomprehensible to many students, who distrust such readings as defying, contradicting, or betraying the surface "truth" of the poem. But when one points out the abstract terms, "he will not see me," "the darkest evening of the year," "promises to keep," and "miles to go before I sleep," the latter phrase ominously repeated at the end, students open to the suggestion that something underneath the tightly packaged rhyme and meter that constitute the surface of the poem simmers insistently.

It is in this interstice — between the surface appearance and the underlying possibility — that a way of using the mind begins to develop. The ability to master interpretation in which multiple, even contradictory, meanings may simultaneously exist is a heightened function of the student's critical mind, one that can be exported to a host of other technical and business applications; indeed, anywhere inventive genius is to be preferred over rote imitation and mindless following. Without this ability to imagine, to create, to see implications, one is not separated from "brutishness," a moral state Aristotle finds abhorrent (Aristotle/McKeon (340BCE/1947) p. 442, Book VI, ll.10-15). Interpretation, then, is not only a right, it is a way of (re)claiming one's membership in humanity.

LEARNING TO BE HUMAN AND THE VALUE OF ACADEMIC SCHOLARSHIP

There is a long-standing human truth found in Plato, Aristotle, Augustine, and later refined in John Locke's concept of *tabula rasa* that argues human beings are not born knowing how to be human. They must be taught. In the *Republic*, Plato argues that ideally, a child is taught to "rightly object to what is shameful, hating it while he's [sic] still young and unable to grasp the reason, but, having been educated in this way, he [sic] will welcome the reason when it comes and recognize it easily because of its kinship with himself [sic]" (Plato/Grube (380BCE/1992) p. 78, ll. 402a). Education, virtuous and otherwise, has always required a healthy dosing of propaganda, so that individuals are taught what they ought to like and dislike.

The hegemony of the literary *canon* (i.e., what ought to be studied in English Literature curricula) began to be questioned after World War I when returning veterans sought education in subject matter they understood. It came under increasing scrutiny in the latter half of the twentieth century when returning Vietnam veterans sought culturally significant studies reflective of their experiences, and was accelerated further as literatures by and about women and people of color began to displace the "dead white men," whose literature comprised the staple of literary study for a millennia. What makes the modern study of literature so insanely difficult is its sheer abundance and diversity. We get more cultural-historical clues from period literature than we do history books, for history is written by the victors, while the oppressed make art.

It is the province of academic scholarship to sort out matters pertaining to its particular focus, and experiences of a very practical kind can be gotten from researching literature in focused bursts. These praxes include: defining academic-scholarly literature, distinguishing secondary sources from primary sources and texts, developing focused perspectives that are achievable in short papers, and practicing impeccable presentation in a prescribed format. Students learn to distinguish the plethora of superficial information about a primary text, which tends to endlessly repeat only what is commonly known, from academic-scholarly articles, which tackle meaning at deeper, more focused, and more significant levels.

Tim O'Brien's "The Things They Carried", for example, may be thematically understood variously: 1) Lt. Jimmy Cross must discard his interest in Martha as interfering with his ability to lead his men; 2) O'Brien's text is essentially anti-feminist as Lt. Jimmy Cross tries to obliterate Martha by swallowing her, burning her, and burying her; 3) Lt. Jimmy Cross is overwhelmed by grief for his "real" lost love, Ted Lavender, for whom his psycho-sexual desire nearly costs him and his men their lives (the subtext of the story depicts homophobia); 4) The story reveals the psycho-spiritual costs of the warrior code, in which Lt. Jimmy Cross's humanity, his emotions, his heart, his ability to love must be dispensed with so that he may lead; 5) The story is a *rite de passage* wherein a boy becomes a man.

Any one of these themes is supportable by the text, but clearly, they do not all agree. Students in pursuing literary critical opinions may develop their own unique perspectives. A variety of secondary textual insights, coupled with a primary text, formally presented according to a prescribed format, and intelligibly composed with original insights is not only a juggling act; it forces students to encounter a variety of critical interpretations and involves them in the dialogic nature of discourse, which leads them, of necessity, to synthesize original and unique points of view. Without any theoretical pedagogy/andragogy in play, students achieve Bloom's penultimate exercise of the mind: synthetic understanding.

CREATING LITERARY TEXTS AND TEACHING

Of course, the highest goal of Bloom's taxonomy is to create and teach. Students can begin to do this with joy in their achievement if allowed the time and space to create a poem, a short story, or even a creative memoir, and then teach each other about their goals and intentions as creators, and provide interpretations and insights as reader-responders.

The creating mind improves with cultivation. Students may learn best by simple imitation of a form. Consider this effort from Katika imitating Frost, with Frost on the left and her imitation poem on the right:

Frost:	Katika:
Whose woods these are I think I know.	*This home I love this i avow.*
His house is in the village though;	*This family is together now;*
He will not see me stopping here	*I'll never stray and never roam*
To watch his woods fill up with snow.	*To see them grow my love somehow.*

(*personal communication, November 5, 2016*).

Although Katika's verse has syntactical flaws, she imitates Frost's rhyme and meter down to the last iamb and point of punctuation flawlessly. Having students create an imitation of this kind helps them to feel their way through a poem structurally. Also, relieving students of the pressure to compose a "good" poem enables them to experience poetry writing as craft, rather than emotional outburst, which so many students regard as the prerequisite for and point of poetry.

Emotional poetry — that is poetry in which the *author* exists in a state of heightened emotions — is a fundamental reason students fear creating: they fear the judgment not only of what they make, but of who they are. In beginning with imitation, one removes the assumed necessity of a strong emotion. Authorial emotion as the prime motivator of good poetry is simply nonsense, anyway. Assuming strong emotion as a prerequisite for poetry is akin to assuming virtue in political discourse. As the student begins to develop some ability in the craft of poetry, the place of strong emotion is reinvented — not as something the author experiences, but as something s/he wishes the reader to experience. This is what T.S. Eliot called *significant* emotion:

> Poetry is not a turning loose of emotion, but an escape from emotion; it is not the expression of personality, but an escape from personality. But, of course, only those who have personality and emotions know what it means to want to escape from these things (pp. 58-59).

Eliot composes these thoughts at a time when Emotivism was profoundly embraced by the Bloomsbury group, the leading intellectuals of the day, as a means of rejecting their own Victorian roots, mired in a Christian legacy,

which ceased to have power in their lives (MacIntyre, 2010, p. 16). Eliot (1928) ultimately rejected the secularism of Bloomsbury and reaffirmed his essential conservatism as a "classicist in literature, royalist in politics, and Anglo Catholic in religion" (pp. ix-x). It is after Eliot publishes his seminal poem, reflective of his own shattered society, *The Waste Land* (1922), that he reinvents himself as a conservative and subsequently commits his art to Christian representations, themes, symbols, and critiques of literature and culture.

WISDOM IS NOT IN-BORN

The study of literature is not only a possible benefit to students in STEM programs, it is an essential way to use the brain interpretively, creatively, and necessarily improves outcomes and achievements in STEM endeavors. The mind engaged across multiple layers of meaning, of formal arrangement, trained in the art of persuasion, and progressively achieving the ability to manipulate words into meaning is crucial to the mind that invents, discovers, and understands intrinsic meanings, implications, assumptions, and consequences. Anyone sufficiently exposed to information can discover the process by which to construct a bomb. But only the morally-ethically intelligent mind, the mind possessed of practical intelligence to be sure but also of what the ancients called "soul" intelligence, may determine whether s/he ought to be building bombs or whether information about bomb-building ought to be censored.

It is in the body of human stories that one develops the soul's intelligence. Exercises in understanding theme, character, setting, plot, dialogue, and description begin the cultivation of transcendent ways of thinking, not only about literature, but about all information that comes to us in words. Literature teaches us empathy. It provides us with a vocabulary to bring our nascent awareness into focus.

> In "Choruses from 'The Rock'" (1934), T.S. Eliot presaged,
>
> Where is the Life we have lost in living?
>
> Where is the wisdom we have lost in knowledge?
>
> Where is the knowledge we have lost in information? (p. 96).

Wisdom is not in-born; it is created by individuals interested in creating it. And we learn and are taught to love wisdom and become interested in creating it by having strong mentors with the courage to rise above mere rules, policies, and procedures, which only make real conversation about real matters conveniently unnecessary. As Barry Schwartz (2009) warns in his Ted talk, "when there is an over-reliance on rules, moral will is undermined, destroying our desire to do the right thing. In the long-run, [rules] are at war with wisdom." Although rules, policies, and procedures create the uniformity that precludes chaos and under-performance for students and faculty alike, too many rules inflexibly applied also ensure mediocrity. Similarly, incentivizing work is essentially de-moralizing, and creating courses in ethics, merely relegates them to their own sphere, which can be blithely avoided and ignored in all other walks of life. "All work that involves other people is moral work," Schwartz argues, "and moral work requires moral wisdom." He advocates for moral heroes — in education, a role once held by faculty, a role that has eroded out from under them.

Of course, Stanley Fish (2008), disagreed entirely: "To answer the question, 'of what use are the humanities?', the only honest answer is none whatsoever" (para. 13) he boldly proclaims. Fish coyly admits to the possibility of moral absolutes, but he rejects any actual frameworks for them (2011, para. 3). He had previously adumbrated these provocative ideas in his book, The *Trouble with Principle* (1999) and was reviled by Terry Eagleton (2000), whose scathing review dismissed him as:

> ...the Donald Trump of American academia, a brash, noisy entrepreneur of the intellect who pushes his ideas in the conceptual marketplace with all the fervour with which others peddle second-hand Hoovers...

> He fancies himself as an intellectual boot-boy, the scourge of wimpish pluralists and Nancy-boy liberals [but who is, ultimately] tamely conservative (para. 2-3).
>
> What makes this dialectic possible is the emotivist society in which we have become increasingly mired since the early twentieth century.

A BRIEF OVERVIEW OF EMOTIVISM

Alasdair MacIntyre (2010) argues that, if there is a zeitgeist for our age, it is governed by emotivism. This position holds that all moral judgments are ultimately only matters of subjective desire, often unconscious, which may be disguised by rational language, but which are at root merely matters of "personal preference" (p. 20). There can never be a rational framework to contradict emotivism. It is tautological in that it cannot recognize the possibility of such a framework existing — the suggestion of one is to be regarded as nothing more than another expression of personal preference. The resulting society after a century of emotivism is one in moral "degeneration," in which people have become means to ends, rather than ends in themselves (MacIntyre, pp. 22-23). The self and its preferences reign supreme, but over what?

In business, old loyalties between employers and employees cannot be expected. In education, the relationship between teachers and students is severely compromised. Meaning is a matter of purely individual and subjective negotiation as we are increasingly cut off from a holistic society that once by virtue provided a rule for the individual, a moral compass. Everything, including personal preference is now relative, and the individual must muddle through as best s/he may. Those individuals possessing or longing to possess some notion of moral absolutes are only expressing their subjective, emotively-held perspectives and desires. Thus we have a diversity of communities, which barely touch each other; and within each community, whole populations of individuals are also cut off and alienated from each other. And our only truths are those which exist in the realm of "fact, the realm of means, the realm of measurable effectiveness" (MacIntyre, p. 30). The problem is that "fact" itself is severely contended; it is a chimera, obscured by the oppressive mass and weight of sheer information, which includes an abundance of false, "fake," facts. With no absolutes, no society to ground the individual in a consensual truth, s/he exists in a constant state of falling without any hope of landing or of being caught. As s/he falls, the many "experts" along the way are of no help, as they are limited to and by spheres of expertise, unable to speak to any other spheres. Medical doctors can only explain the body's chemistry; the psychologist can only speak to his/her particular field of expertise, Freudian, behavioral, cognitive; and the minister, only to his/her sphere of doctrines.

Daniel Orozco's (1994/2015) "Orientation" lays out the problem brilliantly:

> These are the offices and these are the cubicles. That's my cubicle there, and this is your cubicle. This is your phone. Never answer your phone. Let the Voicemail System answer it. This is your Voicemail System Manual. There are no personal phone calls allowed. We do, however, allow for emergencies. If you must make an emergency phone call, ask your supervisor first. If you can't find your supervisor, ask Phillip Spiers, who sits over there. He'll check with Clarissa Nicks, who sits over there. If you make an emergency phone call without asking, you may be let go (as cited in, Roberts & Zwieg, 2015, p. 284).

Orozco's society, and by implication our own, defy common sense as the individual in a genuine emergency has no place to land. The offer of an emergency provision is effectively nullified by the layering of rules and policies, which govern it out of existence. Later, in Orozco's story, the self is situated as merely one more boundaried self surrounded by other disconnected and boundaried selves — Amanda Pierce, whose husband subjects her to violent sex games, and who "comes to work freshly wounded each morning"; Gwendolyn Stitch, who collects penguins (Pen Gwens) and cries and vomits in the women's restroom; Kevin

Howard, a known serial killer, who never lets his murderous obsession interfere with his work; Anika Bloom, whose left palm bleeds ceaselessly; and Barry Hacker, whose dead wife haunts the office, and schedules herself in meetings with her husband (pp. 285-287). These bizarrely concatenated selves, dripping with irony, remain meaninglessly assembled, like the cubicles that entrap and keep them safe from each other's intuitive empathy.

This society, like our own, has lost all moral absolutes, and the individual exists in a vacuum, fragmented by experiences which never enjoin to produce a whole life, only the life of the moment, disconnected from the past, without an imaginable future. The modern, emotivist self has gained sovereignty, but it has lost all stability and identity in rejecting the framework that once ordered it and gave it meaning. One's life as an integrated experience in a pageant of experiences shared by others has been lost, and we are sovereign over a self, devoid of significance:

> Life's but a walking shadow, a poor player
> That struts and frets his hour upon the stage
> And then is heard no more: it is a tale
> Told by an idiot, full of sound and fury,
> Signifying nothing (Macbeth, Act V, Scene V, ll. 17-28).

But, of course, Shakespeare's audience was meant to reject Macbeth's nihilism, to understand it as the expression of a mind poisoned by ambition, over-reaching greed and desire — what the Greeks called *pleonexia*, or "grasping after" (MacIntyre, p. 183). Shakespeare intends Macbeth's story as a cautionary tale, a morality play that prompted his audience toward virtue.

Modern society has lost a unified concept of virtue. "Whose virtue?" we ask. And that is the crux of society's problem. We have lost any point of reference to situate all other points in a unified moral story.

TEACHING HOLISTICALLY: THE MEMOIR

Literature, all literature, is essentially elegiac. Once the word has been expressed, the original thing — the vibrant, original thing — ceases to exist. Once the student grasps this fundamental idea of the separation between language and objects — the concealment of truths that exist beyond the reaches of language — the student can begin to recreate the self and the society in which s/he finds him/herself caught.

In this regard, memoir can be a powerful tool in teaching literature from the inside out, from a composing and interpreting mind as opposed to a baffled, fact-finding mind. To compose artfully from memory allows students to experience creative-nonfiction prose, unpolluted by theories of composition. They learn, hardly aware that they are learning, in a native manner by doing the thing instead of reading about how to do the thing. They are permitted to own their subject matter and its thematic point and purpose, invested in their reception by their reading-peer critics who provide them with an immediate audience. Students may be invited initially to tell their stories using the first-person subjective pronoun, as they experienced the memory; but they may also be invited subsequently to recast the memoir in the third-person, so that they begin to develop a nuanced understanding of "voice" in narrative. Saying, "I was very smart and brave to have survived x" makes one sound like a conceited prig; whereas, "She was very smart and brave to have survived x" creates a heroic character, admired independently of the egoistical self.

This lesson in "voice" is eminently practical for other courses and communications in which the endless parade of "I think," "I feel," "Personally," "In my opinion," "In my personal opinion," "In my *humble* opinion," do nothing to advance ideas but only draw attention to the individual as a subjective ego, whose opinions (personal, humble, notwithstanding) add no content or value to the discussion. Training students in public discourses of power, in voices that

command respect and attention, do no end of good to every other subject in the curriculum. Literate public discourse, such as threaded discussion, must be regarded as a moral-ethical activity and not a "release of the querulous ego," which is always, at root, "anti-social" (Frye, 1963, pp. 47-48).

The memoir also helps students to begin to understand the self, not as fixed and immutable, but very much under construction. Such students may begin to see that when they change their narrative, they change the life of the self and by logical extension the life of the society in which they live. Winston Churchill, who lived with "the black dog," as he called his intermittent depression, upon his election as Prime Minister observed:

> I felt as if I were walking with destiny, and that all my past life had been but a preparation for this hour and for this trial . I thought I knew a good deal about it all, I was sure I should not fail (as cited in Best, 2001, pp. 165-166).

It is in the study of literature, of rhetoric, of poetry, and of the narratives of heroes that are philosophical and historical that we build the contemporary self and society in connection with the past and toward a future in which it is hopefully worth living.

Literature presents opportunities to not merely extend vocabulary, observe structure, imitate persuasion, and deepen one's commitment to that "right" one first encounters prior to formal instruction and which is strengthened and re-integrated by formal instruction. This study teaches us how to be human; it reminds us of what we once valued and can again.

NOTES TOWARD METHODOLOGY IN THE STUDY OF LITERATURE

What to study in a marketplace so rich with choices is a minor problem to solve. Literature of the past, connected to our modern society, relative to the narratives of our students is critical, for once the connections to the past are lost, they are lost forever. That is why literature must be studied recursively, over time, building on progressively more complex and inter-related materials: the Bible, Aesop's fables, Plato, Aristotle, Augustine, Chaucer, Shakespeare, Dickens, Hawthorne, Melville, Emerson, and the plethora of modern literature from women, people of color, and world literatures in English — there is ample grist for the mill.

How to study literature in technologically-rich contexts poses a more interesting problem to solve. The study of literature has sunk into the turgid wading through quicksand that seems to threaten death by boredom. We are in an educational moment, however, that permits the service of various technologies. Having students not only create literature in connection to existing literature, but practice it orally and present it in voice-video capture for an audience provides the opportunity for students to gain competency across a spectrum of skill sets: creating, connecting to existing literature with understanding, internalizing the goals of both the existing and created literature, presentation skill, and "defense" or explanation of what the student or poem under considered critique was trying to accomplish. Such an assignment raises the bar and invests students in outcomes, as their peer-responders have an opportunity to critique them. The positive nervous energy in the desire to succeed raises the study of literature from turgidity to sublimity, to Bloom's highest feature of the mind: creativity and teaching others. Students do not soon forget such accomplishments, and these kinds of experiences are what cause them to reflect positively upon their education.

Web-conferencing software in online and blended environments in literature courses is indispensable as literature needs discussion; student ideas rise in group-thinking, suggested interpretations, and the dialogic imagination. Literature without discussion loses its dynamic quality, and students trying to solve complex symbols and themes on their own sorely need

their peers' and professors' interactions and guidance. Poems, stories, and narratives, like the lives we are living, are meant to be shared and empathetically explored. As we do so, we come closer together as individuals; we bring history and the present moment into focus; and we reconnect with those truths that exist in and beyond the limitations of language.

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INSTITUTIONAL GRIDLOCK IN THE UNITED STATES CONGRESS

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ABSTRACT

During the 1948 election, President Truman campaigned against the "Do Nothing Congress" that had passed a total of 906 bills. The 114th Congress, which ended January 3, 2017, enacted a paltry 329. Among a variety of factors, an increase in partisan or institutional gridlock has been cited as a significant cause of legislative stalemate. By demonstrating the close interconnections between polarization, game theory, and gridlock in a comprehensive discussion, this literature review presents a synthesis of the most important empirical and the theoretical developments in the emerging consensus on gridlock. The author further suggests that the evolution of empirical studies on Congressional gridlock in the post-Mayhew era has diverted attention from the possibility that gridlock might be, in some sense, desirable.

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Keywords: gridlock, partisanship, polarization, Congress, game theory, legislative action

INSTITUTIONAL GRIDLOCK IN THE UNITED STATES CONGRESS

It seems that the idea of gridlock might be best explained as a clash between the built-in limitations of what American government was shaped to do and what American government is currently required to do. But how has our understanding of this topic evolved over the years? There is now a scholarly consensus (Ho, 2014; Lee, 2013; Saeki, 2009; Woon & Cook, 2015) on the following three points:

- Congressional gridlock exists and can be measured in many ways, including (a) overall legislative productivity, (b) comparative legislative productivity as measured by the ratio of passed laws to laws open for consideration, and (c) comparative legislative productivity as measured by the ability of Congress to pass laws of particularly high importance to the country.
- Congressional gridlock can be predicted through the phenomenon of ideological polarization, which has been defined as the mean difference between the two parties on the liberal-conservative continuum.
- Ideological polarization exists because of the distribution of strong preferences among members of Congress, which, in turn, could represent the 'responsible party' desire to better reflect strong preferences in the electorate itself (Arnold & Franklin, 2012; Costello, Thomassen, & Rosema, 2012; Mair, 2008).

Yet the building of consensus on gridlock has taken years to form. This paper will not only present the arguments on behalf of the three hypotheses above, but also take a chronological approach to explaining how and why scholars arrived at the current consensus and identify gaps in discussions surrounding the topic.

One of the gaps in the existing literature is that scholars have not tended to mix insights from the various research traditions that have informed gridlock. For example, Poole and Rosenthal created an influential dataset on polarization encompassing over 130 years of Congressional activity, but did not attempt to correlate these data with gridlock. Meanwhile, Krehbiel (1998) and other scholars have integrated polarization and gridlock findings, but have neglected to more categorically explore the contribution of game theory (which is the conceptual explanation of why polarization and gridlock are related). By demonstrating the close interconnections between polarization, game theory, and gridlock in a comprehensive discussion, the literature review presents a synthesis of the most important empirical and the theoretical developments in the emerging consensus on gridlock.

AN INTEGRATED THEORY AND EMPIRICAL MODEL OF GRIDLOCK

Sarah Binder, one of the pre-eminent scholars of gridlock in the post-Mayhew era, wrote that "how we define gridlock largely shapes how we measure it" (Binder, 2003, p. 35). Binder offered a definition of gridlock as "the share of salient issues on the nation's agenda that is left in limbo at the close of a Congress" (Binder, 2003, p. 35). There are several other definitions of gridlock, some of which are conceptually similar to the definition offered by Binder. According to Bond and Fleisher, gridlock is "a lack of movement toward solving the nation's problems," (Bond & Fleisher, 2000, p. 188). In his 1991 book, *Divided We Govern* Mayhew used a definition of gridlock based on the success or failure of the passage of so-called landmark acts or laws (Mayhew, 2005, p. 80), which Mayhew also refers to as "significant lawmaking" (as cited in Mayhew, 2005, p. 80). Mayhew's main finding was that the same number of landmark acts passed in both united and divided governments, suggesting a low intensity of gridlock. Gridlock has also been defined as the existence of "Too much fragmentation or too many 'veto points'" (Wiarda, 2005, p. 23) that can prevent government from being able to mount legislative responses to change. Ho argued that gridlock refers to two very specific situations, namely (a) one in which "congressional majorities and the President all want to change policy in the same direction but fail to act due to strategic disagreement or due to certain procedural rules" (Ho, 2014, p. 628) and (b) one in which "legislative action may be impossible because congressional majorities and the President want to move policy in different directions" (Ho, 2014, p. 628). As there is no consensus on exactly what gridlock is, multiple definitions will be invoked over the course of the literature review.

Gridlock is an empirically verifiable outcome; the existence of gridlock can be inferred from the lack of productivity in Congressional decision-making (Binder, 1999, 2003). While the extent of gridlock can be measured, there is an open question as to what causes gridlock (Brady & Volden, 1998; Woon & Cook, 2015). The main explanatory theme emerging from the literature on gridlock is that of polarization (Fiorina & Abrams, 2008; Golder, 2010; Grosser & Palfrey, 2014; Hare & Poole, 2014; Jacobson, 2003; Jones, 2001; Luguri & Napier, 2013; McCright, Xiao, & Dunlap, 2014; Sinclair, 2014; Stanig, 2013). A synthesis of the literature leads to the following hypothesis: The degree of polarization between political decision-makers predicts the degree of gridlock.

This hypothesis is empirically testable; however, it is necessary to examine its theoretical roots as well — in other words, to further explore the question of why polarization might predict gridlock. Many scholars have drawn upon game theory as an underlying explanatory factor for the relationship between polarization and gridlock (Fiorina & Abrams, 2008; Jacobson, 2003; Jones, 2001; Krehbiel, 1998; Krehbiel, Meirowitz, & Woon, 2005). For example, game theory suggests a distinction between

weak preferences, strong preferences, and no preferences (Gilles, 2010; Webb, 2007). These distinctions are particularly important in competitive games. Consider the political agenda item of gun control laws. In Congress, as among the American public, preferences for gun control legislation can be mapped as an inverse distribution (Mitchell-Weaver, 1991). In an inverse distribution of preferences, most actors have views on the extremes of a distribution (Mitchell-Weaver, 1991).

Data from the Pew Research Center (Pew, 2015), which have been drawn upon in empirical studies (Birkland & Lawrence, 2009; Fiorina & Abrams, 2008) of popular and political polarization on gun control, indicate that, as of July 2015, 47% of Americans polled were for what were described as "total gun rights" while 50% were for "total gun control." Thus, 97% of Americans polled held attitudinally strong preferences — whether for gun rights or gun control — on the issue of guns, whereas no more than 3% of Americans held weak preferences (a category that can include having no opinion or simply not caring much).

In game theory, the emergence of a consensus or cooperation is theorized as resulting from the distance between players' payoffs (Gilles, 2010; von Neumann & Morgenstern, 2007; Webb, 2007). This aspect of game theory can be placed into an empirical framework. If 0 represents a preference for total gun control, 50 a complete lack of preference for either gun control or gun rights, or 100 a preference for total gun rights, game theory predicts that the propensity of individuals to seek consensus will depend on the distance between their preferences. In the scheme above, the maximum distance possible is 100 while the minimum distance is 0. The polarization literature, drawing not only upon game theory but also on empirical tests of polarization and consensus, indicates that legislative productivity is more likely when the aggregate distance between decision-makers' preferences is comparatively smaller (Fiorina & Abrams, 2008; Grosser & Palfrey, 2014; Hare & Poole, 2014; Jacobson, 2003; Jones, 2001; McCright et al., 2014; Stanig, 2013).

The polarization and gridlock literature tends to refer to this as a spatial model (Krehbiel, 1998; Krehbiel et al., 2005). Hare and Poole (2014) used such an approach, rooted in the technique of multidimensional scaling, to measure party polarization on the liberal-conservative dimension. Hare and Poole's statistical analysis, which has been complemented and affirmed by other scholars' analyses, indicates that Congressional voting can be almost entirely (according to Hare and Poole, 93%) predicted by the decision-maker's position on the liberal-conservative spectrum. Hare and Poole measured the liberal-conservative distance between the parties in both the House of Representatives and the Senate and found that the polarization between the parties in Congress has been on the rise.

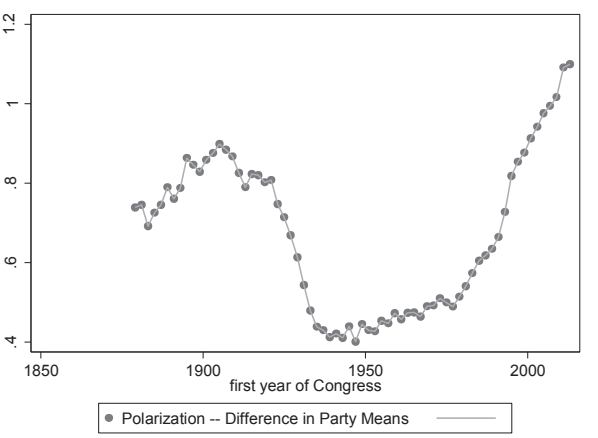

Figure 1. *Growth in party polarization, 1879-2013. Original figure based on dataset from Hare and Poole (2014).*

Hare and Poole's dataset is defined to represent perfect liberalism as -1 and perfect conservatism as 1. Taking the absolute value of the ideological differences between the parties in any given Congressional session allowed Hare and Poole to generate a visual representation of the extent of polarization. The data indicate plummeting polarization between the parties in the wake of the Great Depression, reversing course in the early Clinton years and reaching its highest historic level during the Obama administration. It is possible that historically low levels of Congressional polarization were responsible for the ability of numerous Presidents — including Franklin Delano Roosevelt and Lyndon Baines Johnson — to push legislation through Congress more effectively than their predecessors and successors.

Hare and Poole's quantitative approach to polarization has been echoed in empirical studies of gridlock (Binder, 1999, 2003; Brady & Volden, 1998; Jones, 2001; Saeki, 2009; Woon & Cook, 2015). Some of these studies draw on statistics made available by Congress that focus on (a) the total number of legislative items before a Congress, (b) the number of enacted laws, and (c) the number of failed laws.

Time series graphs on each of these measures have been presented below. The data were collected by Congress itself and have been made available through several sources (Civic Impulse, 2015). The data are presented here because they are drawn upon in key studies of gridlock (Binder, 1999, 2003; Brady & Volden, 1998; Jones, 2001; Saeki, 2009; Woon & Cook, 2015) and because they illustrate various dimensions of the problem of gridlock. Note that, in *Figure 2*, there is a downward trend in the total amount of legislative actions; in *Figure 3*, there is a downward trend in enacted legislative items and, in *Figure 4*, there is an increase in failed legislative items.

While Hare and Poole created an important dataset on polarization, they offered a cursory discussion of gridlock based on seminal definitions and did not develop an explicit theory about the relationship between

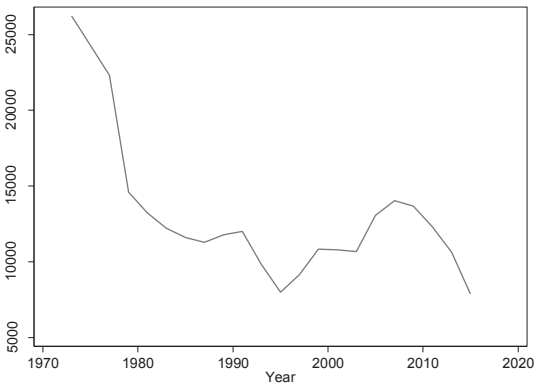

Figure 2. *Time series of total legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016).*

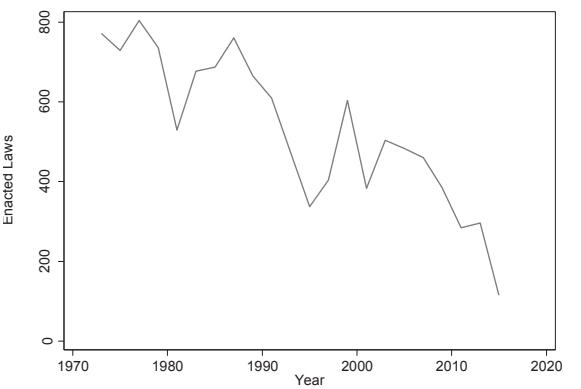

Figure 3. *Time series of enacted legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016).*

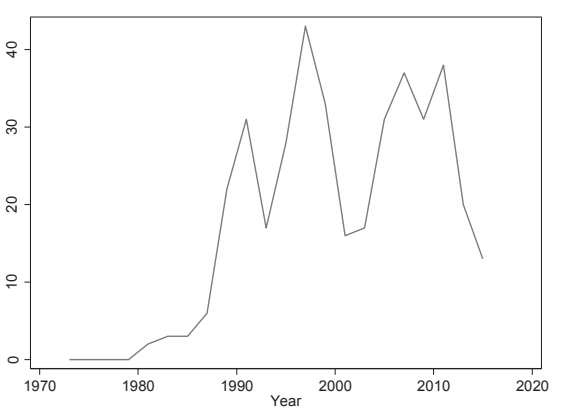

Figure 4. *Time series of failed legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016).*

polarization and gridlock. Krehbiel's theory of pivotal politics is an influential theory about the connection between polarization and gridlock (Krehbiel, 1998; Krehbiel et al., 2005). The heart of Krehbiel's theory is the game-theoretic insight that consensus is more likely between decision-makers when the aggregate distance between their preferences is smaller (Krehbiel, 1998; Krehbiel et al., 2005). The graphs presented below are simplified versions of Krehbiel's more advanced attempts to draw empirical connections between polarization and gridlock. These three graphs (*Figures 5, 6, and 7*) are important because of their illustration of a direct link between Hare and Poole's liberal-conservative dimension of polarization and three measures of gridlock. The graphs replicate the data in *Figures 2*, *3*, and *4*, but with the addition of a 95% confidence interval and an ordinary least squares (OLS) line of best fit to illustrate the existence of trends in the data. The graphs triangulate Krehbiel's findings using a simple regression model rather than a spatial model.

These data indicate that polarization negatively predicts total legislative activity, negatively predicts passed laws, and positively predicts failed laws. Thus, there are empirical connections between polarization and gridlock. This empirical insight is the core of the modern consensus on polarization and gridlock. The next section of the literature review contains a chronological overview of past scholarship that establishes a context for the emergence of the consensus viewpoint.

DEVELOPMENT OF THE CURRENT CONSENSUS ON GRIDLOCK

If governance is conceptualized as having to lead, as is suggested in some of the literature (Treib, Bähr, & Falkner, 2007), then, to be certain, there is a presumptive bias in favor of a productive Congress that churns out legislation on what Binder called salient topics (Binder, 2003, p. 35). If there are simply too many salient topics on the legislative agenda, then gridlock might emerge naturally from the fact that Congress was meant to act on topics that were of the highest salience and would thus override ideological differences. Lee has called attention

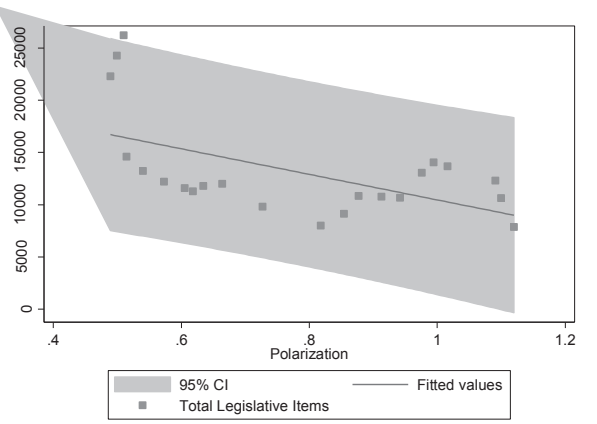

Figure 5. *Polarization and total legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016)*

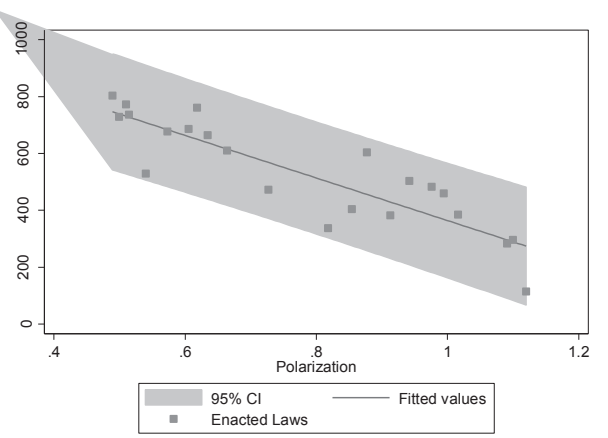

Figure 6. *Polarization and enacted legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016) and Hare and Poole (2014).*

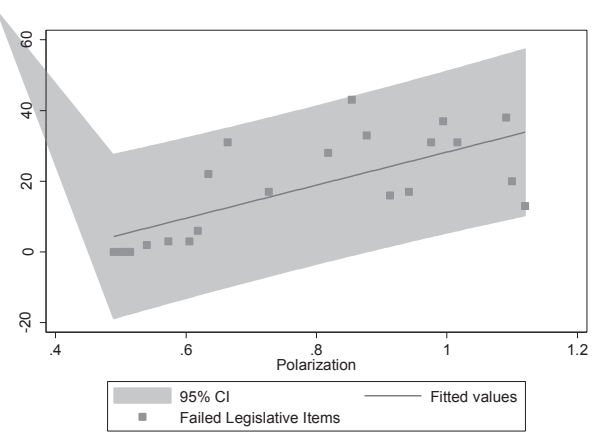

Figure 7. *Polarization and failed legislative items, 1973-2015. Original figure based on Congressional data gathered by Civic Impulse (2016) and Hare and Poole (2014).*

to this dynamic through empirical analysis, noting that there is an inverse correlation between gridlock and issue salience (Lee, 2013, p. 175), meaning that gridlock goes up when issues are less salient and gridlock goes down when issues are more salient. Without invoking Binder specifically, Lee's finding is aligned with Binder's claim that gridlock is associated with low-salience legislative items.

The 110th Congress voted on 861 bills, while the 1st Congress voted on only 16 (Civic Impulse, 2015). The extension of governance into additional corners of public and private life, while reflecting contemporary attitudes about the centrality of government (Douglas, 1989, p. 84), necessarily implies an explosion in the number of legislative acts to be voted on, without any corresponding change in the ease of passing legislation. In the 1st Congress, the matters before the national legislature were, in Binder's phrase, of extremely high salience — issues of truly national significance. Salience has become diluted as Congress has been called upon to handle more and more issues, and this dilution could be the ultimate explanation of gridlock. To some extent, this possibility has been acknowledged by both Mayhew (1991, 2005) and Binder (Binder, 2003, p. 35), who limited their analyses of gridlock to significant or salient legislation. The idea of salience is highly subjective. Binder, for example, described salience as the function of how many times an issue before the legislative branch had been discussed in the editorial page of the New York Times. It is possible that, over time, the idea of salience itself has been defined in an overly inclusive manner. Lee is one of the few scholars who appears to have adopted an exacting standard of what counts as high salience in the context of gridlock (Lee, 2013, p. 175), meaning the use of several dimensions — including mentions in editorials but also qualitative assessments of issue salience.

If the bar for salience is raised, as Lee suggests (Lee 2013, 175), then it might be the case that gridlock is less prevalent than assumed. For example, the 2008 bailout of the American economy was a truly salient issue (Malhotra & Margalit, 2010, p. 853), because it addressed the well-being of the entire country — which, according to Binder (2003), is one mark of salience — and, indeed, Congress took action. Scholars who are inured to — or even actively invested in — the idea of an interventionist, ubiquitous government might count as gridlock those instances of Congressional inactivity that actually reflect the fact that the system is working, that is, by keeping the legislation inert on topics that do not actively require government activity in a Lockean or Smithian version of a liberal society (Abbas & Kumar, 2005, p. 233).

Polsby (1968) argued that institutionalization consisted of three sub-phenomena: (a) well-boundedness, meaning strong distinctions between membership and leadership; (b) internal complexity, characterized by the increasing specialization of functions; and (c) universalism, meaning, inter alia, a determination to follow precedents and rules (Polsby, 1968, p. 144). Polsby argued that one of the consequences of institutionalization was the increasing propensity of Congress to block legislation rather than produce it. Polsby did not offer an empirical test of this claim, and his development of the theory of institutionalization has come to be of diminishing importance in the light of Mayhew's revolution in gridlock studies.

Mayhew's main concern was to calculate the difference between the numbers of so-called landmark acts passed under divided government versus the number of landmark acts passed under united government. Statistically, this model was admirably simple. As there were only two possible values for the independent variable of government (united versus divided) and a continuous dependent variable (number of landmark acts passed), with an independent samples *t* test serving as the obvious inferential measure. Using this test, Mayhew discovered that "it does not seem to make all that much difference whether party control of the American government happens to be unified or divided" (Mayhew, 2005, p. 198). From

this finding, Mayhew concluded that divided government was not a meaningful influence on Congressional gridlock.

Kelly (1993) critiqued Mayhew's methodology by arguing that the most appropriate measure for landmark legislation was legislation that had been identified in contemporary sources as well as discussed in secondary sources. Kelly thus raised the bar on Mayhew's definition of salience (based on Mayhew's own qualitative decisions about which acts of legislation were landmark acts), reducing Mayhew's original data from 267 items of landmark legislation to 147 items.

Kelly's results thus diverged from those of Mayhew. Mayhew found that the mean number of acts passed under united government was 12.78, while the mean number of acts passed under divided government was 11.69. Using Levene's test for the equality of means, Mayhew found that, at a significance level of 0.05, there was no statistically significant difference between the mean number of legislative acts passed under united government and the mean number of legislative acts passed under divided government. After reducing the number of items in Mayhew's original dataset, Kelly found that the mean number of acts passed under united government was 8.78, while the mean number of acts passed under divided government was 6.09 (Kelly, 1993, p. 479). Using Levene's test for the equality of means, Kelly found that, at a significance level of 0.05, there was a statistically significant difference between the mean number of legislative acts passed under united government and the mean number of legislative acts passed under divided government, such that more legislative acts were found to have been passed under united government. Note how this statistical approach, which relied on dichotomous measures of polarization, has subsequently been improved upon by Hare and Poole's (2014) use of a continuous variable to define polarization.

Kelly also replicated Mayhew's use of covariates, including the variables of early term, activist mood, and budget / surplus deficit. In Mayhew's model, the covariates of early term and activist mood were in fact predictors of the generation of legislation. In Kelly's analysis, the change of dataset meant that early term was no longer a significant predictor, and the effect of activist mood on landmark legislation was only around half of that observed in Mayhew's model. Kelly took the results to mean that divided government was in fact a highly important influencer of Congressional gridlock, because more legislative activity took place when government was not divided. Of course, Kelly and Mayhew used different definitions of salience, which explains the difference in their findings.

After Kelly's paper, most of the other scholars working on empirical models of Congressional gridlock — whose findings are described in detail below — have also felt obliged to take some position on the importance of divided government as a predictor of Congressional gridlock. In addition, Kelly's inventive redefinition of salience appears to have inspired other scholars, such as Binder, to articulate and defend their own measure of salience. Mayhew looms large over all of these scholarly efforts, as he was the first to empirically measure Congressional gridlock as a function of other aspects of government (such as the party composition of Congress) and also the first to try to define salience in the context of gridlock.

Binder's 1999 article, *American Political Science Review* added some innovations to the body of empirical literature on gridlock. Binder used her empirical results to support "an alternative theory of gridlock" (Binder, 1999, p. 519) based on "the distribution of policy preferences within the parties, between the two chambers, and across Congress more broadly" (Binder, 1999, p. 519). Binder began by defining gridlock as the ratio of enacted agenda items to all agenda items, filtered by salience — which, like Mayhew, Binder calculated through an examination of the frequency with which a specific legislative topic appeared on the *New York Times* editorial page. Because Binder used a ratio variable rather than an absolute measure of passed legislation, such as the measure used by Mayhew, she was able to generate individual gridlock scores for

every Congress, while Mayhew was not able to. While Mayhew conceived of gridlock as a binary state, Binder's approach allowed gridlock to be measured along a continuum.

Binder's creation of individual gridlock scores for each Congress from 1947 to 1996 radically expanded the scope of possible statistical analysis. For Mayhew, the use of the number of passed legislative acts only allowed a broad comparison between united and divided governments, which (a) offered no insight into time-dependent changes in Congressional gridlock and (b) offered no insight into the quality of specific Congresses in terms of legislative productivity. Indeed, Binder took advantage of the ratio measure of gridlock to conduct time-series analysis designed to determine whether gridlock was increasing, decreasing, or remaining the same over time. Binder found that the amount of gridlock has increased over time. Going beyond her measurement of time-dependent trends in the evolution of gridlock, Binder found that conflict between the House of Representatives and the Senate was the most important predictor of Congressional gridlock.

Meanwhile, Krehbiel's explicit intention was to generate a theory atop Mayhew's empirical findings. According to Krehbiel, Mayhew "did not propose a theory of divided and unified government that accounts for variation in legislative productivity or degrees of gridlock... his finding serves as an essential empirical foundation on which to build a theory" (Krehbiel, 1998, pp. 53-54). Thus, Krehbiel's work provided both a confirmation and a theoretical extension of Mayhew's results. Krehbiel, like Binder but unlike Mayhew, operationally defined gridlock in a manner that allowed each Congress to be evaluated on this measure. On that basis, Krehbiel argued that gridlock was a pervasive characteristic of Congressional activity, with its pervasiveness cutting across times of divided or unified government. Krehbiel introduced or championed ideas that currently constitute the core of an emerging consensus in the literature, one that focuses on the importance of medians.

In terms of influences on Congressional gridlock, Krehbiel developed the idea of gridlock as being determined by the distance between the preferences of legislators. The existence of gridlock is confirmed by data, and, following Mayhew, Krehbiel argued that it cannot be explained by divided or unified government. As Krehbiel and colleagues argued in a later paper, the observed phenomenon of gridlock appears amenable to explanation by any number of theories (Krehbiel et al., 2005, p. 249). The explanation Krehbiel preferred was that of the pivot. A pivot is, in Krehbiel's theory, a weak preference that can be co-opted by the opposing party, thus facilitating the building of a supermajority. For example, a Republican Senator who had weak preferences about gun laws would be a pivot, as this Senator's vote could go in one direction or the other. In an atmosphere of weak preferences, Krehbiel argued, it is easier for legislative activity to take place, because weak preferences lead to fluid coalitions whereas strong preferences are resistant to compromise.

Richman (2011) built on Krehbiel's theory, agreeing with the centrality of pivotal politics as a predictor of legislative action and inaction, and suggesting a role for parties themselves as contributors to gridlock. Richman's main conclusion was that parties routinely seek to apply pressure to pivotal members of their causes in order to prevent legislative actions that would significantly alter the status quo (Richman, 2011, p. 151). Thus, parties tend to seek out and apply pressure to pivots. This insight is important because it demonstrates that polarization is, to some extent, consciously engineered by parties.

Krehbiel's introduction and development of the idea of gridlock ultimately relies on a model of polarization. The further apart voting blocs happen to be, the larger the gridlock space, which can also be conceptualized as the distance between preferences. This claim is particularly useful when matched to polarization datasets (Hare & Poole, 2014). In a majoritarian legislative body, polarization will result in

the changing of agendas to represent more extreme (that is, from the viewpoint of the opposing party median) content. As Cox and McCubbins stated, "the majority can prevent reconsideration of status quo policies lying to the left (respectively, to the right) of the current median legislator on a given policy dimension — thereby filling the agenda mostly with bills proposing leftward (respectively, rightward) policy moves" (Cox & McCubbins, 2005, p. 9). This theory predicts the maintenance of the status quo, which is another means of defining gridlock. The maintenance of the status quo — as defined by a shrinking legislative agenda, fewer enacted laws, and more failed laws — is, as demonstrated in the second section of the literature review, an empirical fact, and, in the House of Representatives, polarization appears to explain how and why the legislative status quo does not often change.

The same logic applies to the Senate, in which the creation of the supermajority necessary for a change in the status quo is also threatened by polarization. This argument was championed by Jones, who argued that "higher party polarization increases the likelihood of encountering gridlock on a given proposal, but that the magnitude of this increase diminishes to the extent that a party is close to having enough seats to thwart filibusters and vetoes" (Jones, 2001, p. 22). Jones' identification of the role of the supermajority concurs with Krehbiel's theory, in which supermajorities also figure closely in the degree of gridlock around any particular legislative act. One of the novel aspects of Jones' analysis is the identification of ideological differences as potential explanatory factors in gridlock. This line of analysis suggested a causal relationship between polarization and gridlock, with higher polarization taken to predict higher levels of gridlock.

This point was addressed, more indirectly, when Krehbiel wrote about how the status quo would become more preferable given the distance between individual legislators. Jones made a substantive case for ideology as the main determinant of distance in a spatial model of gridlock — meaning that ideology determined polarization. This finding has since been confirmed by Hare and Poole (2014), who found that 93% of the Congress's voting record since 1870 can be explained by where on the liberal-conservative spectrum members of Congress fell. Polarization is itself a function of what Sinclair has described as the transition of the two major parties "from fluid coalitions to armed camps" (Sinclair, 2014, p. 308). This well-attested phenomenon (Fiorina & Abrams, 2008; Golder, 2010; Hare & Poole, 2014; Jacobson, 2003; Jones, 2001; Sinclair, 2014) appears to be at the root of Congressional gridlock, albeit through different mechanisms, in the House of Representatives and the Senate. In the House of Representatives, the rules of debate favor the majority (which wields more power through its leadership) whereas the Senate is more amenable to the minority, given its less centralized structure and the reduced role of party leadership. Sinclair's so-called armed camps would be easier to institutionalize in the House of Representatives, whereas, in the Senate, they would exist as natural outcomes of individual Senators' preferences.

DISCUSSION AND CONCLUSION

The hypothesis of polarization serving as the main predictor of gridlock represents the emerging consensus on the topic, and, as discussed earlier, has solid theoretical backing from game theory. The current consensus has emerged from interconnected research on polarization and gridlock that, over time, has established the empirical links between these two phenomena. The purpose of the conclusion is not to reiterate these findings or their theoretical basis but to reflect on the nature of gridlock as a political phenomenon.

The eruption of empirical studies on gridlock in the post-Mayhew era has diverted attention from the claim that gridlock might be, in some sense, desirable. If so, then the topic of gridlock and its influences takes on added interest, because it gestures not merely towards legislative dysfunction but also towards defense against tyranny.

Even the kinds of operational language used by Mayhew, Binder, and other contemporary scholars of gridlock reflect value judgments. Congress is said to be productive, to be passing landmark laws, and to be addressing salient issues. It is not easy to contest such language, for surely few scholars or policy-makers would want to be seen arguing on behalf of a non-productive Congress that does not pass landmark laws or address salient issues. Thus, one of the gaps in the literature on gridlock has to do with the absence of a fair-minded discussion of the role of the legislative body in American life and the resulting reification of legislative action; this theme is taken upon in other political literature emphasizing grassroots change (Brinkerhoff, 1996). Although the work on gridlock continues to take on a quantitative dimension, more qualitative discussion of the topic of Congressional activism versus Congressional restraint also needs to take place.

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A LECTURE TO TEACH GENERIC PROGRAMMING AT AN ADVANCED COLLEGE PROGRAMMING COURSE: A CASE OF VISUAL C++

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ABSTRACT

The term **generics**, in programming, refers to a specially created program object that is not specific to any data type. Generic programming is a technique to design shared source codes to operate on objects of various types. This is an overlooked topic that should be discussed in an advanced programming course; therefore, this paper serves as an advocate for adding this topic to CS- and CIS-related curriculums. The content of this paper will help interested instructors preparing supplementary educational materials, preferably with sample codes, to guide students to learn the core concepts of "generics" from hands-on learning experiences. This paper starts with a brief introduction to why a typed language provides programmers with the flexibility to write "type insensitive" codes, continues with a problem statement and reasons to choose Visual C++ as the language to teach generics, and then discusses the five basic concepts of generics programming: (a) generic class, (b) members of a generic class, (c) generic function, (d) generic interface, and (e) generic delegates.

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C++ and all its descendent languages, such as Visual C++, are "typed" languages. The term **typed** means that objects of a program must be declared with a data type, such as *int* (integer), *double* (floating-point), and *String*. Once the data type is declared, the object can work only with the designated type of data and will refuse to work with data of different types. The purpose for a language to be "typed" is to ensure so-called "type-safety," which prevents a situation in which numeric data (e.g. 123) is mistakenly sent to a function that expects alphabet-only data (e.g. first name and last name). In a "type-safe" application, a number like 123 cannot be assigned to a program object that is declared to accept alphabet-only data such as someone's first name, while the word "Jennifer" is acceptable.

Type-safety is a good feature and should be preserved in C++, Java, C#, and many other languages. Interestingly, many programmers demand to use "typed" languages to build type-insensitive applications. Their purpose is to maximize the support of user-friendliness (such as eliminating the need to enclose a word with double quotes, so "hello" will be treated

as equivalent to hello), not to create a complete "typeless" application. *Table 1* uses a "cash-only" store as analogy to illustrate how the concept of user-friendliness works in this scenario. Even in a "cash-only" store, customers might wish to use credit cards, checks, or other payment methods; therefore, there is a demand for flexibility in payment methods.

TABLE 1: TYPED VS. GENERIC CODES

SCENARIO	TYPED	GENERIC
Analogy	Cash only	Multiple Payment Options
Condition	Customers must pay cash. No cash, no deal	Customers can use credit card, check, COD, cash, and all other supported payment methods
Decision	At the store side	At the customer side

Note: In this analogy, cash, credit card, check, COD are examples of data types.

The need to allow different types of data to share the same code leads to a programming implementation called "generics." The implementation is to write a block of shareable code that is not specific to any data type. The declaration of data type happens only when an object of a specific data type needs to use the shared codes. The data type of the object is declared on a "declare-at-use" basis. In other words, the shared codes are created without binding to any data type, but will be designated a data type when they are intended to be used as that data type.

PROBLEM STATEMENT

Generic programming is an advanced topic because it requires students to have a solid understanding of object-oriented programming (Zhang et al., 2015). It is a topic that should be addressed in an upper-level programming course. Interestingly, this topic has been overlooked by many textbooks and reference books as well as academia. In the appendix is a list of books that do not discuss "generics." On the other hand, this study found several books discussing how the C++ language uses the concept of "template" to implement generic programming. The following is a sample list of books that implement the concept of "generics" through the aspect of C++ "template."

- Vandevoorde, D., Josuttis, N., & Gregor, D. (2017). C++ templates: The complete guide, 2nd ed. Addison-Wesley Professional
- Savitch, W. & Mock, K. (2015). Absolute C++, 6th ed., Pearson

In a nutshell, the concept of "generics" allows the same source code to be used with different types. This goal can be accomplished by using C++ "templates" (Alexandrescu, 2001, pp. 6-11). However, a "template" in C++ language is provided by the C++ Standard Library at the machine code level (Gregor et al., 2006). In other words, these "templates" are compiled into binary files and are packed as shareable libraries. They can be used by programmers, but cannot be modified. Many languages, such as Visual C++, C#, and Java, thus provide packages or classes which allow customization of "templates." These languages allow programmers to write "type insensitive" codes as custom-made "templates" and defer the type declaration to the runtime (Kennedy & Syme, 2001). In terms of programming, **runtime** describes the time period during which a program is executing. These language-specific packages and classes as well as their implementations are the so-called "generics."

Unlike the C++ Standard Library, "generics" are middleware between the machine and the programmers' codes. Source codes of "generics" stay as object codes until they are called to work with a designated data type (which must meet all the constraints specified by parameters), while source codes of "templates" are further compiled to machine codes as a "template" that can only be called to use on demand (Microsoft, 2017a). *Figure 1* (next page) illustrates their relationship.

Apparently, "generics" and "templates" are two implementation techniques. The main difference

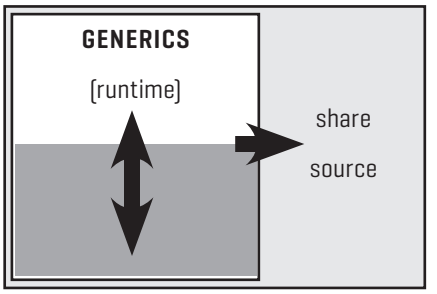


Figure 1. *Relationship between "Generics" and "Templates"*

is what their source code is compiled into. Since "generics" are not designed as a subset of "templates," it should be discussed as an individual topic in an advanced programming course, not just as a special implementation of "templates." Between these two approaches, "generics" are relatively more syntactically modularized and easier for college students to learn, while "templates" are more suitable for an advanced software engineering course. However, with limited supports from textbook publishers, instructors may not find an appropriate textbook. In a college-level course that guides students through the learning of advanced programming techniques, it is probably not practical to require students to allocate a significant portion of time to read several books to learn the core concepts of "generics."

WHY VISUAL C++?

Visual C++ is a descendant of C++; yet, it is a member of the .Net Framework. Microsoft's platform-specific design makes Visual C++ "generics" an apparent contrast to C++ "templates." It helps the instructor to distinguish "generics" from "template" in a lecture. The author recently taught an advanced programming course using Visual C++, in which students learn to develop applications with object-oriented concepts. One of the coding exercises involves the writing of code that is independent of any data type. As an experienced programmer, the author believes that "generics" is a programming technique that can provide a solution to the coding exercise. In order to guide students through the coding exercise, the author prepared instructional contents to take advantage of the "generics" features provided by Visual C++.

In the next sections, this paper will describe how an instructor can walk students through five basic concepts: (a) generic class, (b) members of a generic class, (c) generic function, (d) generic interface, and (e) generic delegates. Each section contains sample lecture contents with simple and practical sample codes that are specially prepared for teaching generics with Visual C++. These five sections are written to facilitate the teaching of "generics" in a college course; therefore, interested instructors should be able to use them as supplementary lecture notes.

GENERIC CLASSES

In terms of an object-oriented program, a class is a blueprint that defines what an individual object should be. Before a generic class can be declared, it is necessary to declare a class "template" using Visual C++ libraries.

```
generic <typename T1, typename T2,
. , typename Tn>
```

where,

- generic is a keyword.
- typename is a keyword. The "typename" keyword is a Visual C++ Generics keyword used to specify a type parameter or indicate to the compiler that an unknown identifier (such as "T") is a type. It is necessary to note that the keyword "class" may be used instead of "typename." As a matter of fact, the parameter "T" does not have to be spelled as "T". It can be a meaningful word like "KeyType" or "ValueType".
- *T1*, *T2*, and *TN* are identifiers. These identifiers are to be replaced by an actual data type when the generic class is instantiated (or declared).

The above template could be written as the following in which the "class" keyword is preferred:

```
generic <class T1, class T2, .,
class TN>
```

With the template, a generic class can be declared using the following syntax. It is necessary to note that a generic class is a reference type (Microsoft, 2017b); therefore, it must be declared with a "ref" prefix. A reference type of data requires the declaration of a pointer that points to (a) memory location(s) where the data was stored.

```
generic <class-key
type-parameter-identifier(s)>
ref class identifier
{
 // class body
}
```

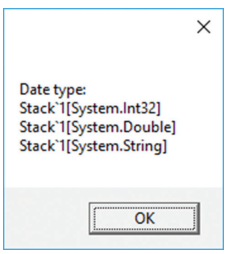
where,

- generic is a keyword;
- *class-key* is either the keyword "class" or "typename";
- *type-parameter-identifier*(s) is a comma-separated list of identifiers specifying the names of the type parameters; and
- *identifier* is the name of the generic class.

The following is a generic class named "Stack" which uses the keyword "typename" to declare a generic data type represented by the letter "T"; therefore, T will be temporarily treated as a type just like *String* or *int*. During the instantiation, the letter "T" is replaced by an actual data type such as *String* or *int*. In the following example, there are three instantiations, each instantiating an object of a different data type. Therefore, "s1", "s2", and "s3" are three instances of the "Stack" class and they are *int*, *double*, and *String* types. The template, `<typename T>`, indicates that the "Stack" class requires only one parameter.

```
#using <System.dll>
#using <System.Windows.Forms.dll>

using namespace System;
using namespace
System::Windows::Forms;

generic <typename T>
ref class Stack { };

int main()
{
 Stack<int>^ s1 = gcnew
Stack<int>();

 Stack<double>^ s2 = gcnew
Stack<double>();

 Stack<String^>^ s3 = gcnew
Stack<String^>();

 String^ str = "Date type: \n" + s1-
>GetType() + "\n";
 str += s2->GetType() + "\n";
 str += s3->GetType() + "\n";

 MessageBox::Show(str);
}
```

A sample output looks similar to the following. It illustrates that each of the instances is an instance of a different data type. The **GetType()** method returns the type of an instance.



The following is a generic class named "Flower" with a parameter "T" representing the unknown data type. It demonstrates how to use the keyword "class" instead of "typename" in the "template."

```
using namespace System;

generic <class T>
ref class Flower { };


int main() {
 Flower<int>^ f1 = gcnew
Flower<int>();


 Flower<double>^ f2 = gcnew
Flower<double>();


 Flower<String^>^ f3 = gcnew
Flower<String^>();
}
```

In the above examples, "T" represent an unknown type, and its type is specified by the programmer during instantiation. In the following example, the instructor chooses to use KeyType and ValueType (instead of "T1" and "T2") to represent two unknown types. During the instantiation, Hash<int, Decimal> will follow the specification of the template and specify that the "h1" instance has *int* as its "key," and decimal as its "value".

```
using namespace System;

generic <typename KeyType,
typename ValueType>
ref class Hash { };


int main()
{
 Hash<int, Decimal>^ h1 = gcnew
Hash<int, Decimal>();
}
```

As stated previously, the "typename" keyword can be replaced by "class" keyword.

```
using namespace System;

generic <class KeyType, class
ValueType>
ref class Hash { };


int main()
{
 Hash<int, Decimal>^ h1 = gcnew
Hash<int, Decimal>();
}
```

Interestingly, a mixed use of "class" and "typename" is acceptable.

```
using namespace System;

generic <class KeyType, typename
ValueType>
ref class Hash { };


int main()
{
 Hash<int, Decimal>^ h1 = gcnew
Hash<int, Decimal>();
}
```

With the template, instances of the Hash class can be created using any primitive data type of Visual C++.

```
using namespace System;

generic <typename KeyType,
typename ValueType>
ref class Hash {};


int main() {
 Hash<int, Decimal>^ h1 = gcnew
Hash<int, Decimal>();


 Hash<int, double>^ h2 = gcnew
Hash<int, double>();
```

```
 Hash<double, String^>^ h3 = gcnew
Hash<double, String^>();


 Hash<String^, double>^ h4 = gcnew
Hash<String^, double>();
}
```

In Visual C++, a programmer-defined class (such as "Her" in the following example) can be treated as a data type.

```
using namespace System;


ref class Her { };


generic <typename T>
ref class Flower { };


int main() {
 Flower<Her^>^ f1 = gcnew
Flower<Her^>();
}
```

All the parameters defined in the template can be replaced by a programmer-defined "data type."

```
using namespace System;


ref class Her { };


ref class His { };


generic <class T1, typename T2>
ref class Hash { };


int main()
{
 Hash<Her^, His^>^ h1 = gcnew
Hash<Her^, His^>();
}
```

MEMBERS OF A GENERIC CLASS

In terms of object-oriented programming, **encapsulation** describes the action to pack methods and variables as members of a class. In other words, adding members to a class is encapsulation. In Visual C++, a class member can be a method, a field, or a property. A field in a class is the variable of the class. A property is a specially arranged abstraction for getting and setting a value of a field. In the general terms of object-oriented programming, **fields** and **properties** represent information about an object, whereas **methods** represent actions an object can take.

In the following, "Hash" is a reference type of class that is declared based on a "generics" template. The parameter "T" represents the unknown data type, so an instance of "Hash" can be of any data type. As an ordinary Visual C++ class, "Hash" can have its own members. The following declares a field named "field1" of the "Hash" class. Since the data type of "field1" will be designated by programmers during instantiation, it is necessary to use the parameter "T" to indicate that its data type is a parameterized type which will be designated by the instance. Another generic field, "field2," is declared as a "private" member of "Hash."

```
generic <typename T>
ref class Hash {
 public:
 T field1; // class field


 private:
 T field2;


 String^ field3 = "user assigned
value";


};
```

In the above example, the instructor purposely creates the "field3" field, which is declared as a *String* type with an initial value "user assigned

value." The field is an ordinary field because it will accept only *String* values. The above example also illustrates that the only difference between creating a generic member and an ordinary member of a generic class is the use of "T" parameter to present the unknown type.

The following demonstrates how to create a default constructor and its polymorphic forms. A class constructor is a special kind of class method; its identifier is exactly the same as the class identifier. A default constructor is a constructor which can be called with no arguments (meaning it has no parameters). Any class constructor with one or more parameters is not the default constructor. The identifier of the "Hash" class is "Hash"; therefore, the identifiers of all its constructors must be "Hash".

```
generic <typename T>
ref class Hash {
 public:
 T field1;

 Hash() { } // default constructor

 Hash(T v) { // constructor
 field1 = v;
 }
};
```

In the above example, the default constructor is an empty constructor (meaning it does not have any statement in its body) and will not perform anything except the creation of an instance. To use the default constructor to instantiate an object, programmers only need to designate a data type to replace "T". The following statement demonstrates the instantiation. The instance "h0" is created by the default constructor, and then "T" is replaced by *int*.

```
Hash<int>^ h0 = gcnew Hash<int>();
```

There is a second form of constructor in which the programmer must specify a value (such as 1.23, "ABC") to let the constructor store the value in "field1." When using this constructor, programmers must designate a data type to replace "T". As shown below, "T" also represents the data type of "v", while "v" represents the value given by the programmer during instantiation.

```
Hash(T v) {
 field1 = v;
}
```

The following demonstrates how to create an instance of *double* type with an initial value of 1.23. As a result, the data of "field1" of the "h1" object is *double*.

```
Hash<double>^ h1 = gcnew
Hash<double>(1.23);
```

The following demonstrates how to create an instance of *String* type with an initial value of "ABC". The data of "field1" of the "h2" object is *String*.

```
Hash<String^>^ h2 = gcnew
Hash<String^>("ABC");
```

GENERIC FUNCTIONS

Generic functions are code blocks with unique identifiers declared based on a generic "template." Like an ordinary Visual C++ function, a generic function may be a method or a constructor in a class, or a standalone function that does not belong to any class. Similar to a "generic" class, a "generic" function needs a "template" with the following syntax:

```
generic <class-key
type-parameter-identifier(s)>
```

With the "template," the way to declare a "generic" function is similar to the way to declare an ordinary Visual C++ function. The following creates a "generic" function of *String* type named "DataType()", which requires a parameter t of "T" type while "T" represents the unknown data type to be designated by the programmer.

```
#using <System.dll>
#using <System.Windows.Forms.dll>

using namespace System;
using namespace
System::Windows::Forms;

generic <typename T>
String^ DataType(T t)
{
 return
Convert::ToString(t->GetType());
}

int main()
{
 MessageBox::Show(DataType(1.23F));
}
```

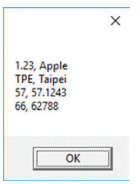
The following is the "void" version of the above code. It also demonstrates that the "typename" keyword can be replaced by the "class" keyword.

```
#using <System.dll>
#using <System.Windows.Forms.dll>

using namespace System;
using namespace
System::Windows::Forms;

generic <class T>
void DataType(T t)
{
 MessageBox::Show(t->GetType() + "");
}

int main()
{
 DataType(1.23F);
}
```

The following is another example. It is an *Object* type of "generic" function which requires two parameters "*T1*" and "*T2*" with each representing an unknown data type to be designated by the programmer. All four instances-- "o1", "o2", "o3", and "o4"-- have completely different combinations of data types. This example also illustrates that Visual C++ generics can be accomplished by casting types (e.g. *int*, *double*, or *String*) to the universal base type *Object*, which is defined by the System::Object class of the .NET Framework.

```
#using <System.dll>
#using <System.Windows.Forms.dll>

using namespace System;
using namespace
System::Windows::Forms;

generic <typename T1, typename T2>
Object^ AddItem(T1 k, T2 v)
{
 return Convert::ToString(k) + ", "
+ Convert::ToString(v);
}

int main()
{
 Object^ o1 = AddItem(1.23F,
"Apple");
 Object^ o2 = AddItem("TPE",
"Taipei");
 Object^ o3 = AddItem(57, 57.1243);
 Object^ o4 = AddItem('B', 62788);

 MessageBox::Show(o1 + "\n" + o2 +
"\n" + o3 + "\n" + o4);
}
```

The following is a sample output. Apparently, the above code creates four instances of the same type (*Object*) with each instance being made of different components.



The following, then, creates an array of *Object* whose elements are four dissimilar components. That is, the "list" array is a collection of elements of different data types. This arrangement eliminates the restriction that elements of a Visual C++ array must be of the same data type.

```
array<Object^>^ list = gcnew
array<Object^>(5);


list[0] = AddItem(1.23F, "Apple");
list[1] = AddItem("TPE", "Taipei");
list[2] = AddItem(57, 57.1243);
list[3] = AddItem('B', 62788);
```

GENERIC INTERFACES

In terms of object-oriented programming, an **interface** is an abstract class created for other classes to be implemented. The term **abstract class** means it contains declaration of at least one empty method. An empty method does not have any substantial features due to its empty body. In other words, an interface in Visual C++ is an abstract class which contains only pure virtual functions. In terms of object-oriented programming, a pure **virtual function** is a function that must be re-defined by the class that implements it. Interestingly, the original C++ language does not have built-in support of interfaces and Visual C++ supports the concept of interface as an extension of the .Net Framework.

The following is an example of generic interface named "IList<T>" with "T" being a parameter that represent the unknown data type to be specified by the programmer. The following also demonstrates how to declare and instantiate a generic interface. Like a generic class, it starts with declaring a "template."

```
generic <typename T>
public interface class IList {
 T DataType();
 bool IsDateTime();
 bool IsNumeric();
 T GetValue();
 void SetIndex(T i);
};
```

The above declares an interface containing five methods: DataType(), IsDateTime(), IsNumeric(),GetValue(), and Display(). Yet, all of these methods are empty methods. They do not have a body enclosed by { and }. Their bodies will be defined by a class that implements the "IList<T>" interface.

The following declares a reference class named "List" which will implement the "IList<T>" interface. It will override (redefine) all the empty methods declared in the "IList<T>" interface. Overriding is an object-oriented programming feature that enables a child class to provide a different implementation of a method than is declared or even defined in its parent class.

```
generic <typename T>
public ref class List : public
IList<T> {
 public:


 virtual T DataType() { return (T) 0;
}
 virtual bool IsDateTime() { return
true; }
 virtual bool IsNumeric() { return
false; }
 virtual T GetValue() { return (T) 0;
}
 virtual void Display(T i) { index =
I; }
};
```

GENERIC DELEGATES

A delegate is a variable of the "reference" type that holds the reference to a method. In terms of programming, a variable can be declared as a data type or reference type. Variables of the reference type assign a reference that points to their data or objects, while variables of the value type directly store their data. In other words, a delegate is a nickname-like reference to call a function. The following defines a "template" using the "typname" keyword.

```
generic <typename T>
```

The syntax to declare a "generic" delegate, which defines data type, identifier, and parameter(s) of a delegate is:

```
dalegate result-type
identifier(parameters)
```

where,

- delegate is a keyword,
- *result-type* is the return type of the delegate,
- *identifier* is the name of the delegate, and
- *parameter* is the list of parameters of the delegate.

The following demonstrates how to declare a delegate named "GenDGT" with a parameter "T" to represent the unknown data type to be designated by the programmer, while "t" is a value of the "T" type.

```
delegate T GenDGT(T t); // declare
generic delegate
```

The following declares a generic function named "getHash()" which will later be delegated by "GenDGT" inside the main() function of a Visual C++ program. However, at this moment, there is no association between the "getHash()" function and the "GenDGT" delegate.

```
generic <typename T>
T getHash(T t) {
 return (T) t->GetType();
}
```

In order for a generic delegate to be a pointer-like reference of a generic function, programmers need to create an instance of the generic delegate (in this case, GenDGT), and then associate it to a generic function (such as "getHash()"). The following demonstrates how to create an instance of GenDGT named "GenDGT1" and designate it to the "getHash()" function as a generic delegate. The identifier is enclosed by a pair of parentheses.

```
GenDGT<Object^>^ GenDGT1 = gcnew
GenDGT<Object^>(getHash);
```

In the above instantiation, the instance "GenDGT1" is declared as the *Object* type; therefore, it supports all the primitive data types of Visual C++. With such an arrangement, "GenDGT1" becomes a "nickname" of the "getHash()" function. The following illustrates how to use "GenDGT1" as a delegate of "getHash()".

```
int main() {
 GenDGT<Object^>^ GenDGT1 = gcnew
GenDGT<Object^>(getHash);


 String^ str = "";
 str += GenDGT1(12.365) + "\n";
 str += GenDGT1(54) + "\n";
 str += GenDGT1("Los Angeles
International Airport") + "\n";
 str += GenDGT1('K') + "\n";


 MessageBox::Show(str);
}
```

It is necessary to note that every instance of a generic delegate can be associated with only one generic function. Once the association is made, the generic delegate is no longer available for other generic functions. In other words, a generic delegate and its associated generic function is in a one-to-one relationship.

The following declares a "generic" delegate named "GenDGTDateTime" with a result type of *bool*.

```
generic <typename T> // declare
generic delegate
delegate bool GenDGTDateTime(T t);
```

The following is the function (named "isDateTime()") which will be delegated by "GenDGTDateTime":

```
generic <class T> // a generic
function
bool isDateTime(T t) {
 try {
 DateTime dt =
Convert::ToDateTime(t);
 return true;
 }
 catch (Exception^ e) { return
false; }
}
```

As an individual delegate, the following demonstrates how to associate "GenDGTDateTime" with the "isDateTime()" function as a delegate.

```
GenDGTDateTime<Object^>^
GenDGTDateTime1 = gcnew GenDGTDateT
ime<Object^>(isDateTime);
```

CONCLUSION

This paper describes how to guide students through hands-on coding activities to learn the basic coding skills that use Visual C++ libraries to create generic codes that can operate on data of any type. The sample codes illustrate how a programmer can create type-insensitive applications by deferring the designation of data type until the moment when it is used. These codes also lead students to visualize (a) how Visual C++ templates define the structure of a parameterized type; (b) how templates provide the foundation of generic programming; (c) how a generic template provides a blueprint for creating generic code such as a generic class or a generic function; and (d) that a measurable benefit of using generics in Visual C++ is the reusability of type-insensitive code. This paper, thus, provides interested instructors with a model for developing supplementary instructional content to teach generics programming.

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Microsoft. (2017b). *Overview of generics in Visual C++*. MSDN. Retrieved from https://msdn.microsoft.com/en-us/library/c570k3f3.aspx

Zhang, Y., Loring, M., Salvaneschi, G., Liskov, B., & Myers, A. (2015). Lightweight, flexible object-oriented generics. *Proceedings of the 36th ACM SIGPLAN Conference on Programming Language Design and Implementation*, 436-445. doi: 10.1145/2737924.2738008

APPENDIX

Commonly Used Programming Textbooks that Currently Do Not Discuss "Generics"

- Bancila, M. (2017). *Modern C++ programming cookbook*. Packt Publishing
- Dawson, M. (2016). *Beginning C++ through game programming*, 4th ed. Cengage Learning
- Guntheroth, K. (2016). *Optimized C++: Proven techniques for heightened performance*. O'Reilly Media
- Liang, D. (2014). *Introduction to programming with C++*, 3rd ed.
- Malik, D. (2018). *C++ programming: From problem analysis to program design*, 8th ed. Cengage Learning
- Zak, D. (2016). *An introduction to programming with C++*, 8th ed. Cengage Learning

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FROM THE CLASSROOM

THE FACTORING FLOWCHART: A PROBLEM-BASED LEARNING TOOL FOR FACTORING POLYNOMIALS

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This article proposes a tool to help students choose the proper factoring technique when factoring polynomials with two, three, or four terms. This tool can be used primarily in a beginning algebra course, but it could also be used in an intermediate algebra course or a college algebra course at the college level, as well as algebra courses at the high school level.

In teaching algebra courses, students consistently have difficulty factoring polynomials. Students seem to do well when learning each of several factoring techniques, but when asked on a quiz, test, or homework assignment to factor a problem without being told which factoring technique must be used, students are often unable to determine the proper technique on their own. Students also encounter difficulty in not being familiar with mathematical terminology relating to polynomials, such as "coefficient of a term" and "degree of a polynomial." Although these terms are important in understanding polynomials and must be covered in an algebra course, they often add an additional burden to students, who must try to keep track of unfamiliar terms while trying to learn factoring techniques.

THE FACTORING FLOWCHART

Textbooks try to help students determine which factoring technique to use for a polynomial by giving a list of questions to ask about the polynomial and then directing students to a factoring technique based on how the question is answered. Here is a list of questions that Lial, Hornsby, and McGinnis (2012) use:

- **Question 1: Is there a common factor other than 1?** *If so,* factor it out.

- **Question 2: How many terms are in the polynomial?**
  - ***Two terms:*** Is it a difference of squares or sum or difference of cubes? *If so,* factor it as in **Section 6.4.**
  - ***Three terms:*** Is it a perfect square trinomial? In this case, factor as in **Section 6.4.**
  - *If* the trinomial is not a perfect square trinomial, what is the coefficient of the second-degree term?
    - *If* it is 1, use the factoring method of **Section 6.2.**
    - *If* it is not 1, use the general factoring method of **Section 6.3**.
  - ***Four terms:*** Try to factor by grouping, as in **Section 6.1.**

- **Question 3: Can any factors be factored further?** If so, factor them (p 426).

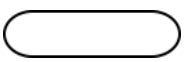
While this list is helpful to students, it could be improved by diagramming, reducing the reliance on technical terminology, while assisting students to the correct factoring technique. Then, the proper terminology and theories can follow, and they will make more sense.

FLOWCHART SYMBOLS

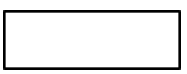
Flowcharts use many standard symbols. Here are three symbols used in the Factoring Flowchart:

CREATION OF THE FLOWCHART

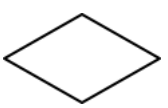
According to the list of questions from the textbook, finding the Greatest Common Factor is the first technique applied to any polynomial. Once that is done, there could still be more factoring. The proper technique to be used at this point depends on whether the polynomial has two, three, or four terms.



Terminal Symbol (Oval) – Used to mark the starting point and end point of a program (Gaddis, 2010).



Processing Symbol (Rectangle) – Contains processing done in a program, such as mathematical equations (Gaddis, 2010).



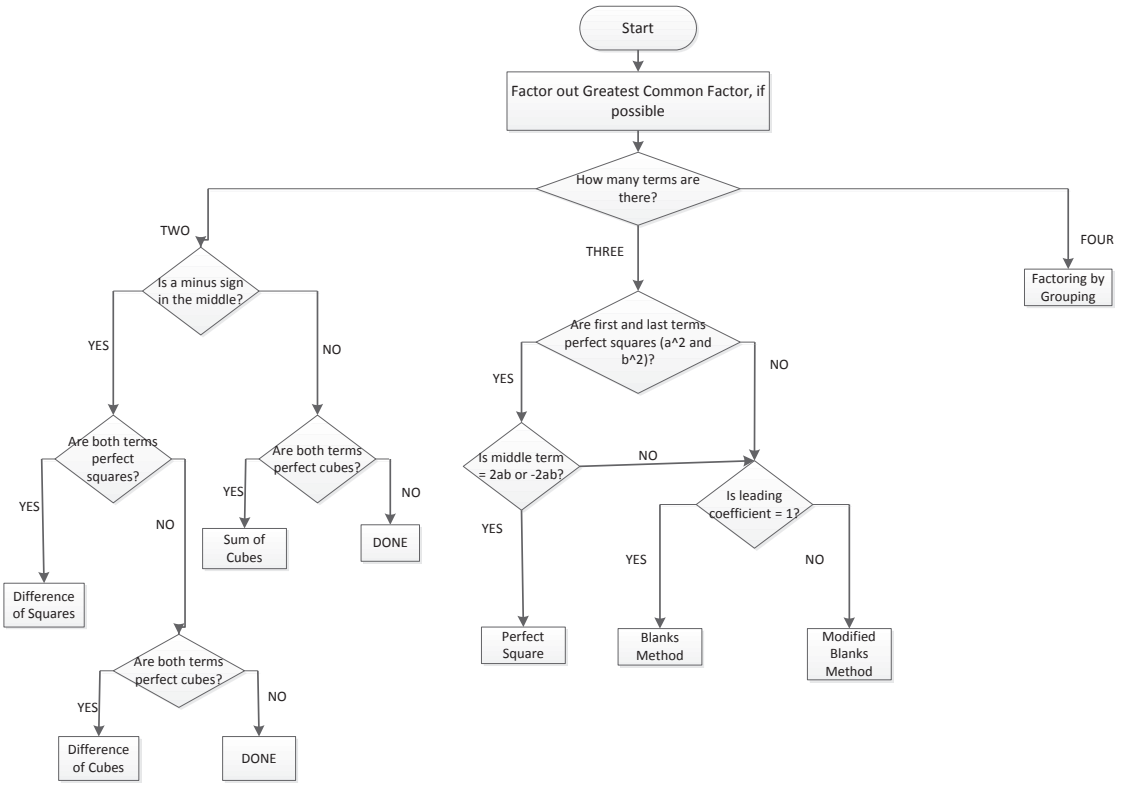
Decision Symbol (Diamond) – Contains a condition to be tested. Processing done is determined based on if the condition is True or False (Gaddis, 2010).

The following list can be used to determine the flow, process, and the proper factoring technique:

1. Factor a Greatest Common Factor out of all terms of the polynomial, if possible. This is always done first for any polynomial.
2. If the polynomial has two terms, one of the following techniques can be used:
   - Difference of Squares, if a minus sign is between the two terms and both terms are perfect squares.
   - Difference of Cubes, if a minus sign is between the two terms and both terms are perfect cubes.
   - Sum of Cubes, if a plus sign is between the two terms and both terms are perfect cubes.
3. If the polynomial has three terms, one of the following techniques can be used:
   - Perfect Square, if the first and third terms are both perfect squares and the middle term can be written in the proper way.
   - Factoring of Trinomials, broken into two categories:
     - » "*The Blanks Method*" (similar to the "Star Method" and the "Tic-Tac-Toe Method"), if the leading coefficient (number attached to second-degree term) is 1.
     - » "*The Modified Blanks Method*" (similar to the "Star Method" and the "Tic-Tac-Toe Method"), if the leading coefficient (number attached to second-degree term) is not 1.
4. If the polynomial has four terms, Factoring by Grouping can be used.

From this, we get The Factoring Flowchart:

The Factoring Flowchart



FACTORING EXAMPLES USING THE FACTORING FLOWCHART

GREATEST COMMON FACTOR (GCF)

The GCF is the first factoring technique that is applied to every polynomial. For example, if our equation is $5x^5 - 25x^3 + 40x^2$, the GCF of all 3 terms is $5x^2$, so the factored form of the equation is:

$$5x^2(x^3 - 5x + 8).$$

FACTORING POLYNOMIALS WITH TWO TERMS

If a polynomial has two terms, there are three different ways to factor it:

- Difference of Squares: $a^2 - b^2 = (a + b)(a - b)$ (Lial, Hornsby, and McGinnis, 2012)
- Sum of Cubes: $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$ (Lial, Hornsby, and McGinnis, 2012)
- Difference of Cubes: $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$ (Lial, Hornsby, and McGinnis, 2012)

Following are examples of each:

Example #1: $144x^2 - 169$

- No Greatest Common Factor
- Two Terms
- Is there a minus sign in the middle? YES
- Are both terms perfect squares? YES, since $144x^2 = (12x)^2$ and $169 = 13^2$
- CONCLUSION: Factoring technique to use is Difference of Squares.

$$144x^2 - 169 = (12x)^2 - 132 = (12x + 13)(12x - 13)$$

Example #2: $8x^3 + 27$

- No Greatest Common Factor
- Two Terms
- Is there a minus sign in the middle? NO
- Are both terms perfect cubes? YES, since $8x^3 = (2x)^3$ and $27 = 3^3$
- CONCLUSION: Factoring technique to use is Sum of Cubes

$$8x^3 + 27 = (2x + 3)\left((2x)^2 - (2x)(3) + 3^2\right) = (2x + 3)(4x^2 - 6x + 9)$$

Example #3: $27x^3 - 64$

- No Greatest Common Factor
- Two Terms
- Is there a minus sign in the middle? YES
- Are both terms perfect squares? NO ($27x^3$ is not a perfect square)
- Are both terms perfect cubes? YES, since $27x^3 = (3x)^3$ and $64 = 4^3$
- CONCLUSION: Factoring technique to use is Difference of Cubes

$$27x^3 - 64 = (3x - 4)\left((3x)^2 + (3x)(4) + 4^2\right) = (3x - 4)(9x^2 + 12x + 16)$$

FACTORING POLYNOMIALS WITH THREE TERMS

If a polynomial has three terms, three possible factoring techniques that can be used:

- Perfect Square, which can be written as the square of binomial: $a^2 + 2ab + b^2 = (a + b)^2$; $a^2 - 2ab + b^2) = (a - b)^2$ (Lial, Hornsby, and McGinnis, 2013)
- The "Blanks Method", which is a variation of other factoring techniques, such as the "Star Method" and the "Tic-Tac-Toe Method".
- The "Modified Blanks Method", which is another variation of other factoring techniques, such as the "Star Method" and the "Tic-Tac-Toe Method".

Example #1: $3x^2 - 18xy + 27y^2$

- There is a GCF of 3, so factor it out to get: $3(x^2 - 6xy + 9y^2)$
- Three terms
- Are first and last terms perfect squares? YES, since $a^2 = x^2 = (x)^2$ and $b^2 = 9y^2 = (3y)^2$. This means $a = x$ and $b = 3y$.
- Can the middle term be written as $2ab$ or $-2ab$? YES, since the middle term is $-6xy = -2(x)(3y)$.
- CONCLUSION: Factoring technique to try is Factoring a Perfect Square

$$3(x^2 - 6xy + 9y^2) = 3\left(x^2 - 2(x)(3y) + (3y)^2\right) = 3(x - 3y)^2$$

Example #2: $x^2 - 7x - 30$

- No Greatest Common Factor
- Three Terms
- Are first and last terms perfect squares? NO, since 30 is not a perfect square
- Is leading coefficient (number attached to x^2) = 1? YES
- CONCLUSION: Factoring technique to try is The "Blanks Method"

Here is how The "Blanks Method" works. When factored, the result will look like this:

$$x^2 - 7x - 30 = (x \_\_\_)(x \_\_\_)$$

Of course, there will be either positive or negative numbers that fill in the blanks, so our job is to find the right numbers for the blanks. To do this, we must be aware of two things:

- If the two numbers in the blanks are added together, we will get the coefficient of the middle term (number attached to x). This means ___ + ___ = –7
- If the two numbers in the blanks are multiplied together, we will get the constant term (number with no x's attached to it). This means ___ * ___ = –30

So this means we must find two numbers that work for both of the following equations:

___ + ___ = –7
___ * ___ = –30

At this stage, if you already see what numbers will work, that's great! If you don't see it right away, take the constant term and list all possible factorizations for it. In this example, the constant term is –30. So here are the ways 30 can be factored:

1*30, 2*15, 3*10, 5*6

Once the factors are listed, you just have to "eyeball" all the possible combinations and determine which one of them would be the most likely to work. In this case, it's 3 x 10, as long as we make the 10 negative. Therefore, we now have:

3 + (–10) = –7
3 * (–10) = –30

We can now complete our factoring:

$$x^2 - 7x - 30 = (x + 3)(x - 10)$$

Example #3: $6x^2 - 11x + 4$

- No Greatest Common Factor
- Three Terms
- Are first and last terms perfect squares? NO, since $6x^2$ is not a perfect square
- Is leading coefficient (number attached to x^2) = 1? NO
- CONCLUSION: Factoring technique to try is the "Modified Blanks" Method

Here is how the "Modified Blanks" method works:

- If the two numbers in the blanks are added together, we will get the coefficient of the middle term (number attached to x). This means ___ + ___ = –11
- If the two numbers in the blanks are multiplied together, we will get the constant term (number with no x's attached to it) multiplied by the leading coefficient (number attached to x^2). This means ___ * ___ = 6 * 4 = 24

So this means we must find two numbers that work for both of the following equations:

___ + ___ = –11
___ * ___ = 24

For this problem, the numbers –3 and –8 will work for both equations. Therefore:

(–3) + (–8) = –11
(–3) +* (–8) = 24

Unlike the "Blanks" Method, however, we cannot simply say $(x–3)(x–8)$ is our answer. For the "Modified Blanks" Method, we re-write the middle term using the two numbers that fill in the blanks. Since our middle term is $–11x$ in this example, $–11x = –3x –8x$; therefore, the equation now becomes: $6x^2 –3x –8x + 4$. Since we now have four terms in the equation, we can do factoring by grouping. To do this, pair up the terms in the equation and factor the GCF out of each pair:

$$(6x^2 –3x) + (–8x + 4) =$$
$$3x(2x –1) –4(2x–1) = (3x–4)(2x–1)$$

So our final answer is:

$6x^2 –11x + 4 = (3x–4)(2x –1)$

FACTORING POLYNOMIALS WITH FOUR TERMS (FACTORING BY GROUPING)

When a polynomial has four terms, multiple techniques can be used, such as the Rational Root Theorem and Synthetic Division. However, for the purposes of this discussion, we will focus on using only a factoring technique from Beginning Algebra: Factoring by Grouping.

Example: $7x^3 – 14x^2y – 3xy^2 + 6y^3$

To use Factoring by Grouping, follow these steps:

- Group the factors in pairs, including signs:
  $(7x^3 – 14x^2y) + (–3xy^2 + 6y^3)$
- Factor the GCF out of each pair:
  $7x^2 (x– 2y) –3y^2(x – 2y)$

At this point, if the same expression is in both parentheses, factoring has been done correctly. If the same expression is not in both parentheses, rearrange the terms in a different order and group again (NOTE: If the same expression cannot be obtained in both sets of parentheses, the polynomial is not factorable). In this case, our answer is:

$$(7x^2 –3y^2)(x – 2y)$$

PROBLEM-BASED LEARNING (PBL)

Knowlton (2003) defines Problem-based Learning (PBL) as "any pedagogical approach that requires students to solve for an unknown" (p. 5). This definition definitely applies to The Factoring Flowchart. While the initial equation is known, the equation in factored form, as well as the proper technique to factor it, is not known.

Knowlton (2003) cites three characteristics of PBL which also apply to the Factoring Flowchart:

1. "Inherent to PBL is a connection to self-directed learning" (Knowlton, 2003, p. 6). When given an initial equation, students must determine on their own where to proceed in the flowchart based on the characteristics of the equation. This helps

develop a logical thought process, which can be applied to other mathematics courses, as well as areas outside of mathematics.

2. "PBL requires students to be active" (Knowlton, 2003, p. 6). Although individual factoring techniques can be memorized and repeated, the only way to determine which technique should be used is to actively go through the flowchart. This also gives students the opportunity to actively participate in class by being asked to go through the flowchart step-by-step and determine where to proceed. In addition, the use of non-technical terminology seems to encourage students to be active as well. Being able to put a name to a technique, such as "The Blanks Method", is far easier to remember than just saying "that one technique we used in Section 6.3". Students actually have fun with it!

3. "PBL promotes collaboration" (Knowlton, 2003, p. 6). The Factoring Flowchart can be used to promote collaboration among students in the following way: when a polynomial is put on the board in an algebra class, students can be asked to form groups, then each group is given a copy of the Factoring Flowchart and is asked to correctly factor the polynomial. Being able to share ideas and discuss why ideas were brought up helps students to better learn and retain the process illustrated by the Factoring Flowchart. It also gives students more confidence in themselves.

SUMMARY

The Factoring Flowchart has proven successful at helping students navigate the factoring of polynomials. Students have commented the flowchart, as well as the terminology used, have helped them understand factoring much better. In fact, one student in a beginning algebra course commented that her supervisor at work saw her using the flowchart and asked if his daughter, who was taking algebra in high school, could borrow it to help with her homework. The supervisor later reported the daughter said she absolutely loved it and that it helped her to finally understand factoring (personal communications).

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Keywords: polynomials, factoring, second degree, Perfect Square, Difference of Squares, Sum/Difference of Cubes

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FROM THE CLASSROOM
WHY WRITING MATTERS

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Texting? No Problem M8

One hundred and forty character tweets? #Easy

A catchy Instagram post? "Been there, done that."

A persuasive evidence-based memorandum arguing in support of a controversial bill addressing an issue of personal, local significance? Unfamiliar, challenging, and potentially overwhelming.

Formal writing poses multiple challenges for the thousands of returning (once considered non-traditional students but now more the norm) adult learners for whom social media lingo is much more comfortable than critical analysis in the written form.

Most published big data on successes in higher education focus on graduation rates, retention and associated job acquisitions. But other, less-cited smaller data is just as telling. While we celebrate graduation rates, there is concerning data that our graduates, many with stellar records, struggle to communicate through evidenced-based persuasion, research, and the written word.

A 2012 McKinsey & Co. survey found that approximately 39% of employers highlight a "skills shortage" and fewer than half of surveyed employers "believe that new graduates are adequately prepared for entry-level positions" (Mourshed, Farrell & Barton, 2012). This same August-September of 2012 McKinsey survey saw a disparity between employer and education provider perceptions of both competency and importance of new hire written communication skills (Mourshed, Farrell & Barton, 2012). Bruce Nolop (2013) of the Wall Street Journal has bluntly stated that, "[o]ur graduates lack writing skills". Nolop references the lack of writing skills as one of the "biggest gaps in workplace readiness" (Nolop, 2013). According to George Leef, "[p]eople in and out of the academic world have been pointing to a glaring defect in our education system [:]...a failure failure to teach students to write competently" (Leef, 2015).

I doubt these authors refer to all, or even the majority of, graduates. Still, any number greater than one is too high. A college degree should represent a badge, a credential that the holder is a competent, proficient writer. Anything less is unfair to the student and all who look to institutions of higher learning as obligatory stepping stones to a better tomorrow. The potential costs - personal, professional, and societal - are too high. If we accept the so-called writing on the wall, the questions then become first "Why?" and second "What do we do to fix it?"

In an era of accelerated sessions and accompanying degree programs, students are often asked to swim before they are taught to formulate the required strokes. Writing expectations differ across disciplines. Cognitive load makes the task of learning to write in a new discipline challenging even for strong writers. Students often take classes in multiple disciplines, but too rarely do we provide the foundational tools, guidance and especially time needed to meet each discipline's expectations. In our fast-paced era of instantaneous electronic communications, weekly papers and non-stop deadlines, we often overlook and underestimate the time commitments necessary for pre-writing, editing, reflection, draft and revisions. Students leave courses, and ultimately programs, confused. Their writing strokes (in whatever form) are rarely stronger than when they first dipped their pen in the proverbial pool of ink.

Change at the system or program level is, while possible and desired, hard. It's time consuming, requires administrative support, and is often costly. Thankfully, individual instructors, at the classroom level, can make a significant impact. As Robert Collier has said (and many others have agreed), "Success is the sum of small efforts - repeated day in and day out." For writing and growth, small efforts can translate into larger successes. For instructors (of any discipline) seeking to support their students' writing, along with their students' mastery of content, there are many easy to implement options. The following list offers a few suggestions.

TEN IDEAS TO TRY IN YOUR OWN CLASSROOM:

1. Provide Resources. If we ask students to prepare writing in APA format, we should provide a sample paper representing exemplary APA style. We can link to the Purdue OWL and/or the APA Style Blog. For students struggling with grammar, we might share a link to a free course, recommend a favorite book, post links to helpful LibGuides, or suggest subscribing to a site that provides daily writing tips. If we anticipate students might struggle with the meaning of terms in a complex article assigned for the week, we might post a glossary of terms (e.g., Cornell Law School's Legal Information Institute for legal terms) to help support understanding.

2. Post Models and Examples. Would a professional writer ever submit a piece for publication without reviewing models from prior issues or journals? Probably not. How, then, can we expect students to competently produce, often in a mere 7 days' time, concise, persuasive and cohesive argument papers? Guided examples (written or in video format) help. Consider asking strong students if you can share their work (anonymously) in future terms.

3. Start Early. From the beginning of class, remind students that you are looking for both content and writing (including clarity, grammar, structure, and form) in all submitted work.

4. Acknowledge the Challenges. Writing is hard. Ernest Hemingway has shared, "There is nothing to writing. All you do is sit down at a typewriter and bleed." (For more of Hemingway's guidance, see Hemingway on Writing). Share your struggles. Mindset and determination to improve can be impacted by shared experiences.

5. Remind and Reiterate. Don't stop after Week 1. Reiterate the challenges and how to overcome them. Starting your twentieth paper is often just as hard as starting your first.

6. Share Personal Experiences. Did you visit Writing Centers during your college days? How do you currently work to improve? Students respond positively to honesty and advice.

7. Share Proof that Effort Pays Off. To get physically strong, we lift — repetitively. To become adept at preparing healthy meals, we practice — often. Many argue that a full

10,000 hours of the right kind of practice is needed to become good at anything. Share data on persistence and Writing Center successes. Let students know their efforts make a difference.

8. Encourage Reading For Pleasure. Research has long identified the positive impact of reading on writing. Encourage your students to immerse themselves in the words of their favorite authors. Encourage them to explore new authors, too.

9. Offer Peer Review and Teaching Opportunities. According to Edgar Dale's Cone of Learning, we remember 10% of what we read, 20% of what we hear and a whopping 90% of what we both say and do, or teach (Dwyer, 2010). Provide teaching opportunities through peer reviews and student critiques.

10. Convey the Relevance of Writing as a Skill. Share data on the skills employers look for in prospective employees. Highlight the potential value of strengthening this skill, including employability, job performance, and a competitive edge.

Have tips and best practices to share? Please continue the discussion.

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Keywords: Writing skills, skills shortage; best practice ideas

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DeVry University Journal of Scholarly Research (2018) / Volume 4, Number 1

CINEMA VERITE?

Scott, I., and Thompson, H. (2016). ***The cinema of Oliver Stone: Art, authorship, and activism.*** **Manchester, United Kingdom: Manchester University Press. ISBN: 978-1-5261-0871-5. 305pp. $19.95.**

WILLIAM HAYES
COLLEGE OF LIBERAL ARTS & SCIENCES

Reviewer Note: William Hayes is Senior Professor of Liberal Arts and Sciences, DeVry University, Chicago, IL.

When I first saw the title of this book written by Ian Scott and Henry Thompson, I became curious. I enjoy Oliver Stone's films, but I have always been skeptical. What I mean by this is that the plots of the films intrigue the viewer. But this intrigue, at least for me, has always been accompanied with a bit of doubt. I always wondered if Stone's personal bias crept into the validity of his films' content: were they somehow shaded by his personal views and political beliefs? After reading this detailed study, my doubts have vanished. Scott and Thompson take great pains to examine not only the man and his vast body of work, but to also provide a comprehensive analysis of Stone through a combination of carefully arranged content, exhaustive background information about every Stone film, and last but not least, transcripts of interviews with the complex and deeply committed film maker himself.

Scott and Thompson divided their study into five categories: War, Politics, Money, Love, and Corporations. Once they established these categories, the order in which they were presented creates a logical sequence that sheds light on many facets of Stone and his work. The choice of beginning with "War" is calculated. Not only was "Platoon" Stone's first film, but it was based on his combat experience in Vietnam. The authors simultaneously grab the reader's attention and his emotions by beginning with a personal quote from Stone in which he talks about his mother, and how she would feel about him being in Vietnam. It ends with, "I wonder what she will say when she finds out about this. My limbs suffering, waiting in this groin wound of a rotten field in Vietnam" (p.28). The following sections dealing with War, Politics, Money, and Love follow the same pattern. They all begin with quotes which make the reading a personal invitation to learn about the man, his philosophies, and his motivations for making each of his films. The strategy is effective. The result gives the reader a personal closeness to and a better understanding of Stone in ways that don't seem overly academic and didactic.

The best way to discuss the how the authors examine all of Stone's films, is to share the quote which begins the book's section, "Love". Once again, they draw upon Stone's actual words: "With the exception of *U Turn*, all of my films have an aura of optimism about them. In *World Trade Center*, it is feelings of family that pull the people out of the hole. In *W*, Laura Bush is a binding force. In *Wall Street*, love is also important" (p. 161). Knowing what exists in Stone's mind now allows the reader to view the analyses of each film from a different and more personal lens. The authors then carefully group Stone's films in a very subtle, yet deliberate and calculated manner by alternating sub categories such as "the war on terror", "politics and cultural

authority", and "corporate dysfunction", with the titles of a majority of his major films. Once again, the details of the films' plots are thorough and accurate without overwhelming the reader, and the interjection of Stone's views of the times his films were made, interspersed with his personal views on the topics, ultimately increases the reader's knowledge and appreciation of Stone and his body of work.

The book is lengthy, detailed, and leaves no stone (no pun intended!) unturned. Yet it doesn't overwhelm. The work is carefully planned, and it leads the reader in a step by step manner to a natural conclusion. This conclusion contains transcripts of interviews the authors conducted with Stone. Looking back, this makes perfect sense. The authors make sure that the reader, through elaborate presentation of facts and personal information, knows just about everything there is to know about Oliver Stone, and now the reader can finally meet the man himself! Again, the authors rely upon the use of sub-headings when presenting the transcripts in a categorical manner. And, they spare no words. Each interview is verbatim, sometimes lengthy (but necessary), and just like the rest of the book, informative and eye opening.

I highly recommend this book. I feel now that I not only know more about Oliver Stone, but also the films he has made. My doubts about the validity of his interpretation of events has disappeared and been replaced with a deeper understanding and acceptance of each film's message. If I were to make one suggestion, I would take the liberty of slightly modifying the tile of Ian Scott's and Henry Thompson's work just a bit: *The cinema of Oliver Stone: Art, authorship, activism, and understanding!*

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BETTER TOGETHER

Hartley, S. (2017). *The Fuzzy and the Techie: Why the liberal arts will rule the digital world.* New York: Houghton Mifflin. ISBN: 978-0-544-94477-0. 290 pp. $28.00

JOHN MORELLO
COLLEGE OF LIBERAL ARTS & SCIENCES

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Bill Gates once told a group of state governors that support for liberal arts education should be cut, and the money given to STEM (Science, Technology, Engineering and Math) programs. Vinod Khosla, formerly of Sun Microsystems, has said that not much being taught in liberal arts programs is relevant to the future. And Netscape founder Mark Andreessen predicted those who learn the soft skills of liberal arts will end up working in shoe stores. As *Washington Post* education reporter Valerie Strauss puts it in a March 2016 article, "Trashing the liberal arts seems to have become practically a sport" (As cited in Hartley, 2017, p.208). If the liberal arts are so useless, why is LinkedIn run by Reid Hoffman, a philosophy major? How could Ben Silberman lead Pinterest with only a political science degree? And how did Hewlett-Packard survive under Carly Fiorina, with her degree in medieval history? Good questions, says Scott Hartley, and he tries to answer them in *The Fuzzy and the Techie: Why the liberal arts will rule the digital world*. Seeing liberal arts majors running tech enterprises seems contradictory. But if anyone's going to figure out why, it's Hartley himself; a venture capitalist today, with stops at Google and Facebook, and a degree in Political Science. He's a *Fuzzy* among *Techies*, the two terms he heard at Stanford to describe the tech-proficient and those not. "My education taught me that I wouldn't be graduating with a second-class set of skills to those learned by techies across campus," he writes, "but rather a complementary set of skills ...necessary in today's technology driven economy" (p.7). He and others like him must have found encouragement in Apple pioneer Steve Jobs, who said that "technology alone is not enough-it's technology married with liberal arts, married with the humanities, that yields us the result that makes our heart sing" (As cited in Hartley, 2017, pg.7). But, says Hartley, getting both parties to the altar has been an uphill battle, and the liberal arts have been taking heat from politicians, especially when they think there are votes to be won. He reports that Jeb Bush suggested universities should warn psych majors that they'll end up working for Chick-fil-A, and that Florida senator Marco Rubio thinks welders make more money than philosophy majors "because the market for Greek philosophers is tight" (p.208). While that rhetoric may get laughs on the campaign trail, Hartley suggests it's the *Fuzzies* and not the *Techies* who'll have the last laugh. He offers a 2016 *Wall Street Journal* survey of 900 executives, 92% of whom said the soft skills *Fuzzies* possess were "equally important or more important than technical skills" (p.206).

So, just what are those 'soft skills', and how come the *Fuzzies* have them, and the *Techies* don't? Hartley says journalist Fareed Zakaria nailed it in his 2015 book I*n Defense of a Liberal Education*.

Zakaria claims that the liberal arts "highlights creativity, problem solving, decision making, persuasive arguing and management skills" (As cited in Hartley, p.14). Hartley adds a few of his own. "The humanities and the social sciences are devoted to the study of human nature. The greatest opportunities for innovation are in applying evolving technological capabilities...to solve human problems like political corruption, finding better ways to educate children, helping people live healthier and happier lives. Workers with a solid liberal arts education have a strong foundation to build on in pursuing these goals" (p.15). Liberal arts students are required to study a broad range of subjects. "In our ever-changing world", he argues, "the demand for intellectual agility, creativity, and the curiosity to explore new terrain is higher than ever" (p.26). The development of these skills is the reason he says so many employers are hiring liberal arts grads, no matter what the tech titans may say. And while he cites findings published in *Liberal Education*, claiming 74% of employers say a liberal arts education is the best way to prepare for success in today's global economy (p.28), probably eliciting howls of bias, he follows that up with LinkedIn's 2015 study of the job market, which concluded that "liberal arts grads are joining the tech workforce more rapidly than technical grads" (p.28).

How could this have happened? It happened, says Hartley, because the *Fuzzies* avoided the specialization trap which ensnared their *Techie* contemporaries. "It is actually in the STEM fields that specialization is more of a problem," he claims, "with the course loads for many degrees leaving little room for... pursuit of intellectual passions ." (p.25). And he allows Georgia Nugent, a senior fellow at the Council of Independent Colleges to assess the consequences of tech specialization. "It's a horrible irony," she writes in an article for *Fast Company*, "that at the very moment the world has become more complex, we're encouraging our young people to be highly specialized. We are doing a disservice to our young people by telling them that life is a straight path" (As cited in Hartley, 2017, p.26).

So, the *Techies* have no soft skills, and the *Fuzzies* lack technical chops. Now what? Hartley has an answer: teamwork. He devotes several chapters to potential advances in medicine and education if both sides could see they're really just two sides of the same coin. But he singles out the importance of collaboration in the area of national security. "Harnessing...new technologies to combat escalating threats is essential," he writes, "so collaboration between Techies and those with the skills and perspectives of both the humanities and social sciences is critical" (p.181). There is a case to be made, he argues, for what *Fuzzies* can add to understanding the complexities of conflicts, their causes, and the limits of technology in war. And, while he admits high-tech weapons have certainly helped take fallible human judgment out of the equation of battlefield conflict, "*Fuzzy* prowess is and will be, critical to waging war" (p.183).

The Fuzzy and the Techie can overwhelm the reader with the surveys and data it brings to make the case that *Fuzzies* will thrive in an ever-evolving world. And, the subtitle, which predicts they'll actually rule that world is a bit contradictory, given the many examples the author supplies to suggest it's a better world if it's shared. And while it's tempting to embrace Voltaire's view that it's time to judge a person on the basis of their questions, not their answers, it's Hartley's view that those who think they have the answers and those who constantly question how the answers were arrived at can coexist.

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BORN TO RUN. AND WRITE.

Springsteen, Bruce. (2016). ***Born to run.*** **New York: Simon & Schuster.**
ISBN: 978-1-5011-4151-5. Pp. 510 $22.75

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To be clear: I am a Bruce Springsteen fan. Since the summer of 1978, when my Uncle Larry first spun "Darkness on the Edge of Town" for me on his Technics turntable, I was addicted to Bruce, his voice, and his music. To this day, his aching, caustic moans and bellows throughout the single "Streets of Fire" have haunted me and have carved a permanent home within my musical soul. Bruce had me at the age of twelve — hook, line, and sinker.

Although I've been a Springsteen fan for nearly 40 years, when I learned he'd been writing an autobiography, which he'd started, stopped, and started again for the past seven years, I was not overly enthused. Having read more than fifteen dull Springsteen biographies, all of which were, ultimately, tiresome reboots of childhood facts and dreary recitals of his musical contractual problems over the years, I assumed *Born to Run* would be more of the same. I had low expectations.

Instead, what I came to find was that Bruce Springsteen's autobiography is much more than a simple memoir; it is a fresh and moving portrayal of his tumultuous relationship with his family, and more specifically, the disconnection between Bruce and his father. Doug Springsteen was, by all accounts, an alcoholic and depressive man, and the two shared a fragile relationship. A simple father-son activity like boxing lessons revealed tension below the surface. "He threw a few punches...that landed a little too hard," writes Springsteen. "I knew something was being communicated. I sensed what was being said. I was an intruder, a competitor in our home" (p.28).

Through his haunting descriptions, Springsteen paints a vivid picture of his 1950s upbringing in a working-class home in Freehold, New Jersey, and his family's strong ties to their Catholic faith. His turbulent childhood, growing up with a father who was not present emotionally, and with his eternally nurturing mother, who seemed chained to the same destructive nature and will of her husband, was one of interspersed joy and pain, a daily tidal wave of emotion. Springsteen also lucidly details his extended family — his grandparents, aunts and uncles, cousins, and childhood friends — who helped him through tough times. At the age of eight, his aunt turned him on to music. He began playing piano, learned to read music, play notes, and develop chord progressions. Springsteen writes about his love of Elvis and the Beatles, and recounts the purchase of his first acoustic guitar in 1964, paying a mere $18 for it at the Western Auto store which, interestingly, sold both auto parts and cheap guitars.

Springsteen also describes the early days of his musical career, and his passion for writing

masterful lyrics, set in blues, folk, gospel, and rock stylings. He shares details of forming his first band, the Castilles, playing in bars and clubs up and down the Jersey shore, and his stormy relationships with band members. Eventually, the Castilles imploded, which led to the formation of his next band, Steel Mill, playing with old and new friends in the late 1960s. But Bruce's fervor for making formidable music outweighed his bandmates' lack of determination, and Steel Mill broke up, leaving him penniless and homeless. He often slept in deserted buildings, on the beach, or on someone's couch. After several other failed attempts to create a new group, he, along with two of his longtime Jersey friends, Steve Van Zandt and Danny Federici, started the E Street Band and released an album in early 1973. A second album debuted later that year, but neither were commercial hits. Two years later, though, in the summer of 1975, the E Street Band broke through with *Born to Run*. With covers on both *Time* and *Newsweek*, Bruce Springsteen was proclaimed "the future of rock and roll."

From this point, the autobiography depicts the rise of Bruce Springsteen and his band to meteoric heights, from playing small theaters of 1500 to jam-packed football stadiums of 80,000. These narratives provide the average Springsteen fan with much more than the facts of the tours. Bruce grants us keen insight to his relationships with his bandmates and his often-debilitating need for complete control. Quite simply, there's a reason he's called "The Boss", and it isn't because of his rock anthems. What we learn directly from Bruce is his deep-seated compulsion for absolute power over his band, his relationships, and his desires. That need, he reveals, has backfired, causing him the loss of friends and bandmates, and struggles with romantic and sexual relationships (marriage, divorce, and marriage again to his current wife, Patti). He also shares his anxieties and fears, which have led to several depressive, incapacitating breakdowns and a lifetime of psychiatric support, which continues to this day. Much of it, he confesses, is an occupational hazard; one moment basking in the adulation of the fans, the next dealing with post-tour depression and anxiety. "The bump is natural," says Springsteen, "... (but) I was so profoundly uncomfortable that I just wanted OUT...walking, sitting down, everything brought waves of agitated anxiety. ...sleep was the only respite" (p. 498). In an age where our rock stars battle daily depression and addictions, often tragically ending in accidental death or even suicide, it's refreshing to read of Springsteen's bouts with horrific mental pain and anguish, and dealing with his demons in what seems to be a normal recovery routine. He becomes even more human when, in later chapters, he describes his struggle to be a faithful husband and a moral father, raising three kids in a modern, frenetic world. With the recent deaths of Danny Federici and Clarence Clemons, bandmates and close friends, he also conveys his angst and distress relating to the inevitability of death, which, as a fan, one doesn't generally expect from his *hero* — thoughtful takes on our short existences.

Born to run is Springsteen's noble shot at setting the record of his life straight. There's no buncombe here; no managers, agents, or editors dictating what should or should not be told. It's Bruce and only Bruce, and it's honest and blunt and straight from the heart. It's his story of life, love, pain, fear, redemption, and renewal. And as a fan, it's exactly what I needed.

Correspondence regarding this book review should be addressed to Shawn Schumacher at sschumacher@devry.edu

DEVRY UNIVERSITY JOURNAL OF SCHOLARLY RESEARCH

CALL FOR PAPERS, FALL 2018 ISSUE

The *DeVry University Journal of Scholarly Research* (DUJOSR) continues to expand its pages to include a variety of publishing opportunities for faculty. Academic scholarship remains a staple for the journal, but new categories include Case Studies, Book Reviews, Letters to the Editor, and a "From the Classroom" section, in which faculty can share vital experiences and best practices. These categories of submission are fully described below. Specific deadlines and instructions for submission conclude this "Call for Papers."

ACADEMIC SCHOLARLY ARTICLES

For the Fall 2018 issue, we continue to solicit "working papers" (3000 to 5000 words) in our scholarly article category.

Papers of all types are welcome including theory, empirical, or methodology papers, as well as literature reviews, from both positivist and naturalistic traditions. Research- and evidence-based papers emphasizing practical relevance that resonate with our readers are preferred. We regard submissions as "working papers" that can be submitted to other journals for consideration (but have not been previously published elsewhere).

The review process requires that each paper is coded and blind reviewed by two peer reviewers with expertise in the author's discipline. Faculty volunteers (for whom profound gratitude is expressed) comprise the peer review board. Final publication decisions are made by the editorial board, consisting of College and Managing Editors.

Authors who have previously submitted academic scholarly papers for past issues are encouraged to re-submit their revised papers. Papers should be sent with an additional document that specifies detailed responses to reviewers' and editors' feedback.

CASE STUDIES

DUJOSR solicits case studies (ranging from approximately 500-word short cases, to 1000 to 3000-word long cases) that have not been published elsewhere, but are considered "working papers." The purpose of this initiative is to create a repository of case studies that can be used by faculty to teach DeVry University graduate and undergraduate courses. Our aim is to provide students with a unique and valuable learning experience that has been generated by our faculty.

The case study should be, significant, complete, compelling, inclusive of alternative perspectives, qualitative, sufficiently evidenced, aligned with one or more Course Objectives, and written with accuracy and relevance.

The review process for case studies is the same as for academic scholarly papers. Case studies will be evaluated on the following criteria:

- Timeliness of case & relevancy (tied to 1 or more Course Objectives),
- Theoretical framework, and practical applications,
- Case development (including discussions if applicable),
- Case notes for faculty,
- Study results,
- Opportunity to expand knowledge,
- Implications to field of studies,
- Writing quality: clarity, conciseness, and organization, grammar and mechanics,
- APA format, including citations and reference page.

There is no submission deadline; case studies will be accepted on an ongoing basis.

BOOK REVIEWS

Book reviews continue to be a regular feature in the journal pages. They 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.

Reviews of either fiction or non-fiction works should adhere to the following publication guidelines:

1. Reviews should be between 500 to 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. Reviews should evaluate the strengths and weaknesses of the work as well as attend to its use of sources, including documentation, methodology, organization, and presentation.
3. Reviews should be fair, balanced, and treat authors with respect.
4. A signed permission form to publish a review is required.

LETTERS TO THE EDITOR

Letters to the Editor are a welcome addition to the journal pages. Letters that reply to or extend academic scholarship published within DUJOSR pages are particularly welcome, as these add rich texture and dialogue to ideas presented. Letters should be professional, well-tempered, and engage with content meaningfully. Letters that do not necessarily attend to previously published work, but are timely and relevant are also welcome.

Letters responding to published articles in DUJOSR should identify the month and year of the article, review, or previous letter on which it is commenting. The full title of the article, review, or letter as well as the author(s) name(s) should be included. Letters should be double-spaced and 500 to 1000 words in length. Letters may express well-tempered opinions, but should include citations in cases where academic integrity requires documentation. Letters should be fair, balanced, and treat authors with respect.

DeVry University
Keller Graduate School of Management

DEVRY UNIVERSITY JOURNAL OF SCHOLARLY RESEARCH

FROM THE CLASSROOM

This section of the journal is newly offered to faculty who have rich pedagogical experiences worthy of sharing with a larger audience. Papers in this category may use research to support ideas, but may also consist of valuable experiences about which research may not have yet caught up. Well-crafted papers that demonstrate increased student engagement in the classroom are particularly prized. In this category, the recommendations for length are 750 to 1000 words, but longer papers of exceptional quality and relevance will be considered. Content should seek to express pedagogies that transcend the commonplace or that provide an interesting new spin on well-trod best practices.

EDITORS' INSTRUCTIONS FOR SUBMISSION AND DEADLINES

All submissions are expected to follow the APA style sheet. Templates and APA source materials are available through the DeVry Commons intranet community site, DeVry University Journal of Scholarly Research, under the following headings:

- 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

The submission deadline is May 31, 2018. Please submit work in any category to Managing Editors, Deborah Helman and Michael Bird, at DUJOSR@devry.edu.

The Managing Editors reserve the right to edit all submissions in any category of submission for length, tone, and content, over and above recommendations made by peer reviewers and College Editors.

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