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University Teachers in Morocco Inspiring Students' Moral Imagination

Discovering Thoughts, Inventing Future

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Inspiring Students' Moral Imagination: Mission and Process

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Abstract- In diverse academic environments, there is an evocative moral question that is tacitly held but rarely voiced: "Who matters?" The answer reflects the circle of moral concern that educators and students hold for themselves, their school, and their community. The enduring challenge confronting educators is how to inspire students to enlarge their circles of moral concern through instructional practices, including: Teacher as Moral Leader, Self-Governing Professionalism, Values-Based Student Conduct, and Teaching and Learning through Visual Imagery.

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I. Introduction

Whatever an educator's instructional goals, "students experience the classroom first and foremost as a social system" (Bowman 2020, 100). Life in classrooms mirrors a complex mosaic of relationships in which there are as many as a thousand teacher-student interactions a day (Jackson 1968). Teaching is not about students in the abstract. Rather, teaching is brought to life by the sensations of what one sees, hears, touches, tastes, feels, and fears. Social-impact teaching compels the moral question: Who matters? In practice, the answer reflects the circle of moral concern that educators and students hold for themselves, their school, and their community. Thoughtful educators tend to have an enlarged circle of moral concern that focuses on the *effects* of their instructional decisions on students both now and in the future. The German philosopher Martin Heidegger argued that what distinguishes human beings is the ability to take a stand on what and who we are. Teachers as moral leaders awaken learners' curiosity related to what and who we are. Other committed educators tend to think in smaller circles of moral concern including "crafting rules of conduct to guide, manage, and govern the spaces between and among students" (Bowman 2016, 100).

II. Purpose of this Paper

The purpose of this paper is to describe and illustrate four instructional practices that contribute to the development of moral imagination in academic environments: (a) Teacher as Moral Leader, (b) Self-Governing Professionalism, (c) Values-Based Student Conduct, and (d) Thinking, Communicating, Teaching, and Leading through Visual Imagery.

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a) *Mission: Teacher as Moral Leader*

A free society is ultimately a moral achievement (Sacks 2020). In a free society, a moral code mirrors a concern for the welfare of others, an enduring commitment to justice and compassion, and a mind-set focused on shifting from "I" to "We" to optimize the success of others as opposed to oneself (Gist and Mulally 2023). Moral thinking reflects the capacity to conceive of social behavior in terms of values that can be found in every culture throughout human history, tracing back to the mythic poem "Epic of Gilgamesh" which appeared in the third millennium B. C. (Joyce 2006). Morality refers to human judgment that some behaviors are right and others are wrong and that "social standards or norms exist to distinguish and guide those determinations" (Gist and Mullay, 8). In Jonathan Sacks' (2020) *Morality: Restoring the Common Good in Divided Times,* the author argues that the divisiveness of our times can be traced to the loss of a shared moral code that has guided society across time.

In academic environments, teacher humility drives the moral virtues of kindness, generosity, integrity, and courage. In the *Screwtape Letters,* C. S. Lewis (1943) argues that courage is not simply one of the virtues but the form of every virtue at the testing point. In the classroom, educator humility reveals a deep regard for the dignity of each student and a commitment to the "Greater Good." In instructional settings, self-honesty and principled courage are a necessary condition for honoring the dignity of individuals and embracing the Greater Good that is enshrined in our nation's founding documents and reinforced in the contemporary practices of diversity, equity, and inclusion. George Mason, the principal author of the First Amendment to the U. S. Constitution, framed the concept of the Greater Good resonantly: "America is a republic. A republic is based on the people and dedicated to the common good. If people put the common good before their own interests, the republic flourishes. If they pursue only private gain, the republic dies" (Moyers 1989).

i. *Process: Teacher as Moral Leader*

Storytelling is one of the very few human traits that are truly universal across culture and through all of human history. In an instructional setting, an emotionally resonant story calls one to the truth of self and the humanity of others (Bowman 2018). Neuropsychologists have observed "that learning is fundamentally an emotional process" (Fabritius and Hagemann 2017,

186). In storytelling, emotion-eliciting input alters learners' brain functioning after only 12 milliseconds---far before students become consciously aware of it (Reisyan 2016). In practice, listening to classmates' personal stories for emergent threads of meaning allows students to share common experiences that contribute to the development of moral imagination. Listening to classmates' stories might, for example, elicit an ongoing, nuanced awareness of the racial narratives that students inherited in their formative years (Wilkinson 2021).

In a morally responsive classroom, the ability to tell the right story at the right time is an essential pedagogical skill (Bowman 2018). The very heart of being an educator "is the desire to tell a story by making sensory, emotional connections with students in an empathetic manner" (Schultz 2011, 273). Zulu is the largest ethnic group in South Africa. Their empathetic story speaks to what makes us human and moral. The Zulu standard greeting, *Sawubona,* is how one says hello. In the Zulu tradition, however, seeing is much more than the simple act of sight---it is the ability to see beyond sight (Rinne 2022). In daily life, *Sawubona* means I see all of you, your dignity and your humanity. I see your pride, your dreams, your fears, your agency, your vulnerability, your power and your pride. As the *Sawubona* greeting melodically rolls off one's tongue, it expresses a resonant sense of: "*I see you and I value you. I accept you for what you are"* (Rinne, 58). The customary response to *Sawubona* is *shiloba*: "I exist for you." More than being simply a casual greeting, *shiloba* radiates an "invitation to witness and truly, fully be in the presence of one another" (Rinne, 58). In instructional settings, the Zulu story serves as the very definition of inclusion: "A sense of belonging and agency. Being valued, seen, and respected for who we are as individuals" (Miller and Katz 2023, 47). The Zulu cultural narrative further serves as a pedagogical imperative that students want to be seen and valued and that doing so is a primary educator moral responsibility in enlarging students' circle of moral concern.

ii. *Moral Purpose in a School Setting: An Illustrative Instructional Activity*

There is a current crisis of faith in many of our political, economic, public health, media, and academic institutions (Kleiner 2018; Bloomberg 2022; Bowman 2023). Recent peaceful and alternately violent protests on many of our nation's collegiate campuses have forced a foundational question: To what extent are our academic institutions inspired and guided by moral purpose? A moral purpose is a value that appeals to an innate sense, held by many individuals, of what is right and worthwhile. In a campus setting, a moral purpose reveals the dynamics of human motivation and behavior. In practice, a moral purpose's effectiveness depends on its connection to the shared culture of humanity to the extent that it draws on philosophical ideas that have stood the test of time (Mourkogiannis 2005).

Imagine a social studies teacher writing three philosophical ideas that have stood the test of time on a classroom white board: Excellence, Discovery, and Altruism. Further imagine that the classroom teacher highlights multiple examples of these distinctive moral purposes by drawing on stories from literature, history, science, and philosophy to illuminate the conceptual tools of excellence, discovery, and altruism. Finally, imagine that the classroom teacher creates a small-group discussion format in which students are invited to discuss and subsequently share examples of how their own school culture either exhibits or fails to exhibit the traits of excellence, discovery, and altruism. Before beginning the small-group activity, the teacher shares three illustrative examples of moral purpose: Medieval craftsmen's commitment to *excellence* built the great cathedrals of Europe (Sennett 2008). Leonardo da Vinci, the 15th-century Florentine polymath, made groundbreaking discoveries in optics, engineering, anatomy, geology, fluid dynamics, weaponry, and painting, highlighted in his 7,200 pages of well-preserved notes (Isaacson 2017). The scriptural parable of the Good Samaritan expresses an *altruistic* moral purpose in helping strangers as well as those that one knows.

iii. *Morally-Responsive Classroom: An Illustrative Learning Activity*

Imagine beginning a social studies or science class by inviting students to consider cultures that have lived sustainably sometimes for thousands of years but are currently *suffering* from the effects of people today who are polluting their environment (Spodek 2023). Imagine inviting students to further consider a statement written on the classroom whiteboard: "Living sustainably is not deprivation if we do so to alleviate the suffering of others. It's love" (Spodek, 74).

Relatedly, in a follow-up small-group discussion, one might invite students to consider what "personal actions" will be required to "live with love" to ensure clean air, land, water and food for everyone: Do I have to drive to school rather than simply walk? Should my family drive a SUV? Or fly to our family vacation destination? Or stay connected to the electric grid rather than using a portable solar kit? Or continue to use disposable diapers?

In a classroom setting, a moral leadership perspective clarifies and simplifies for students the insight that environmental problems all result from one cause: human behavior, driven by the prevailing culture and societal values. The moral implication for students is arresting: Disenfranchised people around the globe suffer from our polluting and depleting. The moral implication for educators is compelling: One inspires and leads students to live by the values you live yourself.

b) *Mission: Self-Governing Professionalism in Academic Settings*

Professionalism is holistic and authentic. The most powerful form of human influence is inspiration. Inspired professional behavior is internal, intrinsic, and sustainable (Seidman 2007). In a morally-interdependent world, professionals inspire principled performance by enlisting others in common cause by contributing one's character and creativity to how a campus pursues its mission. Much like an artist, a professional is both the vehicle and the creator of that which seeks to be born: Something greater than oneself. At its core, professionalism in academic settings revolves around reflecting deeply about what colleagues and students are doing together and how they are in *relationship with each other* as they coevolve a common future (Seidman). In the everydayness of academic life, professionalism enables a faculty to discover shared interests, to clarify its instructional intent, and strengthen its connections with colleagues (Wheatley 2005). Self-governing professional cultures invite and encourage a collective leadership orientation. For true professionals, individual egos exist only in contemplation of the whole.

i. *Process: Professionalism as a Continuous State of Becoming*

Professionalism fills the interpersonal synapses between one student and another, between one colleague and another, between one department and another, between one organization and another (Seidman 2007). In practice, professionalism provides educators the freedom to self-govern around shared values and the desire to accomplish common goals. In academic settings, educators as professionals are self-controlled and self- motivated to act in ways that enhance the capacity of students and colleagues to work collaboratively to achieve instructional outcomes. In classroom settings, educators as professionals think and communicate in the language of those ideals which matter deeply to all human beings: Integrity, truth, transparency, fairness, justice, humility, honor, and service to others (Seidman). In that sense, professionalism is less a matter of what professionals do and more a matter of who they are as moral beings (Wiersma 2010). Professionalism is not something we do. It is something we become.

Civility is one tile in the resplendent mosaic of professionalism. In practice, professionalism radiates a heightened consciousness for relating to others in principled ways. Professional educators sense their own shadows and decry the toxic effects of *incivility* in academic environments, including destructive behaviors such as gossip, condescension, angry outbursts, and collegial and programmatic sabotage. Strikingly, professionalism that is either coerced or externally motivated by systems of rewards and punishments exposes those behaviors for what they are—unsustainable. In contrast, the impulse of true professionalism is a poetic dance, not a forced march.

ii. *Civility: An Illustrative Learning Activity*

Today, intolerance, self-indulgent anger, and vitriolic rants are destroying the civility on which democratic government depends. In our media-drenched culture, citizens and students are being relentlessly exposed to a world of raw emotions in which visceral dislike becomes hatred, anger becomes narcissistic rage, opponents become enemies, and dismay teeters on despair. It is a world where individuals hear ideologically only what they want to hear always confirmed and never contradicted (Bowman 2014).

The very soul of professionalism is the art of conversation-- the ability to create a dialogue that students and colleague will willingly join. In a small-group discussion, students might well be invited to reflect on an evocative question: "Is our country's slide into incivility neither inevitable nor unstoppable in public discourse?" (Bowman 2019) Secondly, students might be invited to consider and debate the relevance of these nine principles for renewing civility in their own classroom and in public settings:

- *Pay Attention:* Be aware and attend to the world and the people around you.
- *Listen:* Focus on others in order to better understand their points of view.
- *Be Inclusive:* Welcome all groups of citizens working for the greater good of the community.
- *Don't Gossip:* And don't accept when others choose to do so.
- *Show Respect:* Honor other people and their opinions, especially in the midst of disagreement.
- *Be Agreeable:* Look for opportunities to agree; don't contradict just to do so.
- *Apologize:* Be sincere and repair damaged relationships.
- *Give Constructive Criticism:* When disagreeing, stick to the issues and don't make a personal attack.
- *Take Responsibility:* Don't shift responsibility and blame onto others; share disagreements publicly. (Seib 2018)

Teachers as moral leaders inspire the impulse of dialogue and respectful conversation in classroom settings. It is the amplification of those impulses which creates a heightened consciousness for relating to others in principled ways that deeply-thoughtful practitioners rightly insist upon calling *teaching* and *learning*.

c) *Mission: Inspiring Values-Based Self-Governance in School Settings*

The ways that students "act, react, and interact are all products of distinct cognitive processes" involving the one trillion nerve cells that comprise the

human brain (Fabritius and Hagemann 2017, IX). In instructional environments, there are essentially only three ways to achieve acceptable student conduct: Coerce, motivate, and inspire (Seidman 2007). Coercive and motivational strategies rely on systems of external rewards and punishments to get students to comply with established rules. In practice, traditional rules are based on transactional relationships in which "educators and students are focused on what they can get for what they have to give" (Bowman 2016, 102). For a besieged classroom teacher, one's initial disciplinary impulse tends to arise from a place of self-concern: "I want to change your behavior with a reward or incentive, so that, if you meet the targets or goals I set for you, this will help me meet my own needs and goals" (Secretan 2005, 14). Traditional classroom management practices subtly reinforce the view that students are the source of most of the problems in academic environments and that educators necessarily have rules to solve those problems. In practice, rules change behavior. Moreover, those who write classroom rules have real power.

The instructional implication, however, is that when students are motivated and managed extrinsically, external forces determine their emotions and behaviors. In contrast, when students are inspired, internalized core values shape students' emotions and interactions. In traditional classrooms, power flows from individuals in positions of authority, including administrators and teachers. In self-governing classrooms, "the primary source of power flows from a set of values-inspired ideas" (Bowman 2016, 105). Values-inspired thinking signals a shift from rules-based authority to moral authority exemplified in shared governance that enables "students to become self-empowered, self-disciplined, and instructionally engaged" (Bowman, 105).

i. *Process: Inspiring Values-Based Student Conduct*

Creating a culture of self-disciplined student conduct begins with modeling for students how to manage the Self: one's character, ethics, integrity, temperament, knowledge, words, and actions (Hock 2000). For educators, values-based stories are an untapped resource with enormous potential for inspiring values-based behavior. Storytelling is as old as humanity itself. Throughout history stories have always been about ethics: The philosophical practice of testing and retesting the consequences of one's actions and their effect on others (Kleiner 2019). In the original mythological version that gave name to the trait, Narcissus, an emotionally detached young man is punished by Aphrodite, the goddess of love, for his refusal to love anyone. His curse to love only himself ended up causing his drowning while admiring his own reflection on a lake (Chamorro-Premuzic 2024).

In the everydayness of life, "stories express how and why life changes" (McKee 2003, 52). Storytelling in classroom settings invites students to calibrate their inner moral compass: What do I believe in? What do I stand for? What matters? What is decency? What are the *values* that guide my daily life? What do we owe one another? (Handy 2019) In a classroom setting, an educator might ask, for example, "What is the moral of the story about Narcissus as it relates to your life?"

Values-inspired conduct is internal, intrinsic, and enduring (Pink 2009). When he was a young student in Virginia, George Washington copied a list of 110 *Rules of Civility and Decent Behavior in Company and Conversation* compiled by French Jesuit priests in 1595 and reprinted in English in 1640. The rules had such a "profound influence on Washington at age 14 that they shaped America's first president and guided many of his decisions and actions throughout his life and presidency" (Dilenschneider 2013, 12). The 110 rules of civility addressed moral issues, but they addressed them indirectly. Contextually, the rules of civility formed the inner person by shaping the outer. In the poem "The Rainbow," William Wordsworth observes that "the Child is Father of the Man." Because values mirror "deep-seated beliefs about the world and how it operates," they function as the emotional rules that govern students' attitudes, choices, and behaviors in the classroom (Freiberg and Freiberg 1997, 146).

Thinking about shared values in the classroom is a pivotal part of linking everyday actions to the common good. As educators and students, to whom are we accountable and for what? Creating a classroom culture of values-inspired governance anchored in the common good begins with the individual student and then proceeds to the class as a whole. Doing so permits each student "to take responsibility for the whole" in which common goals override diverging personal interests (Somerville and Mills 1999, 37). Educators cannot, however, realistically introduce and simply impose core values in academic settings. As exemplified in George Washington's life, individual students must initially be predisposed to embracing common values. While students may or may not care about or actually believe in traditional school governance, values represent things that individuals care deeply about: To betray one's values is to betray the Self (Seidman 2007). Because values mirror an ethical connotation, they empower classmates and teachers to both honor or disavow others' actions. For educators and students, discovering and managing the Self in classroom and school settings mirrors a "complex, unending, incredibly difficult, oft-shunned task" (Hock 2000, 22). Moreover, designing and implementing a "school governance structure grounded in values-based thinking" will likely prove to be the most challenging, engaging, and intrinsically rewarding work in one 's career (Bowman 2016, 105.)

ii. *Designing Values-Based School Governance: An Illustrative Process*

Everything in the classroom is an experiment to discover what works (Wheatley 2024). Life in classrooms continuously gives educators and students feedback regarding what works and what does not work. Reflecting on experience is what keeps educators and students engaged instructionally (Dewey 1916). Admittedly, no single educator, expert, or faculty sees sufficiently to define a classroom management *best practice* for diverse instructional settings. What thoughtful, experienced educators sense contextually is that what works *there* might not work *here,* because *there* and *here* are never identical, with even small differences affecting the desired outcome. Designing and implementing a classroom management system will always be a work in progress for both educators and students. Wheatley (2024) crystallizes the challenge: "The Work: Place the work in the center and keep it there" (11).

d) Mission: Thinking, Communicating, and Teaching through Visual Imagery

Cave wall drawings that date back more than 44,000 years suggest that thinking and communicating in pictures existed long before written language was invented and possibly even before the spoken word (Cherches 2023). A body of research reveals that humans' evolutionary brains were wired for visual images, stories, and metaphors (Cherches). A story is a form of reflection going back centuries as a way to gain a deeper, more inclusive point of view (Simmons 2019). Metaphors create reality. They structure what we perceive, how we perceive it, and how we relate to other people (Lakoff and Johnson 1980). An ancient village, for example, serves as a metaphor and a model for an inclusive classroom. Its inhabitants had names, characters, personalities, and social positions. Nobody owned a village; nobody owns a classroom.

One of the unrelenting challenges that educators and students face is getting others to "see" what they are thinking, feeling, and saying. In Shakespeare's *Hamlet* the term "mind's eye" refers to a mentally recalled visual image unable to be seen by the physical eye. To think, communicate, connect, and mentor, exemplary educators use visual imagery and visual language including pictures, metaphors, mental models, and *stories* to enhance deep learning in instructional settings. A classroom PowerPoint presentation featuring visually stimulating images, as opposed to black-and-white bullet points or text, serves to enhance student engagement, comprehension, and retention (Cherches 2023).

Recent research demonstrates that when text or numbers compete with visual images for students' attention, the images prevail. This phenomenon is known as the Picture Superiority Effect (PSE). When text or numbers are used *in combination with* images, that combination is more effective than either on their own" (Cherches 2023, 21). This is known as Dual-Coding Theory. The instructional implication is that educators who leverage the power of visual imagery in combination with text or numbers increase the probability of student engagement. Relatedly, to enhance their effectiveness in classroom settings, educators need to be more intentional and skillful in using visual imagery and visual thinking in their quest to get students to "see" what they are saying in words and numbers.

i. *Process: Drawing on the Power of Visual Imagery to Capture Student Attention*

In instructional settings, visual imagery allows educators and students to capture ideas, amplify insights, solve problems, and inspire moral action. Leveraging the power of visual imagery, mental models, metaphor, analogy, storytelling, humor, and video supports students in retraining information and deepening moral thinking.

ii. *Morally-Responsive Classroom: An Illustrative Learning Activity*

Visual imagery often reveals multiple moral perspectives by bringing real people to life. Ethically, that changes the way that we look at those human beings and their condition. Imagine a middle-school teacher beginning a social studies class with Andy Grammar's music video, "A Call to Act against Homelessness." Against the backdrop of his latest single, "Fresh Eyes," the pop singer provided haircuts, clean clothes, meals, and kindness to individuals seeking shelter on skid row at the Union Rescue Mission in Los Angeles. Residents who only moments earlier were viewed as vulnerable, marginalized, and invisible were suddenly seen with "Fresh Eyes." For students viewing the moving video in a middle-school classroom, while encountering the cascading lyrics in "Fresh Eyes," the faces of those in the shelter serve to force a series of moral questions: "Why are you looking at me differently?" "Why am I seeing you differently?" "Is it possible for me to see past the homelessness in my midst?" "Can I get to truly know someone beyond their simply being labeled as homeless?" "Did the make-up, clean clothes, haircut, and meals, together with assuming a real-life role in the music video, create a sense of *purpose*, *meaning*, and *importance* for the those living at the shelter?" (Bowman 2018)

III. Discussion

The Scottish philosopher and historian David Hume (2000) observed that moral imagination diminishes with distance. In the uncertainty and ambiguity of their daily lives, students often feel little sense of connection or moral obligation to distant events in the world. Too often those events are

perceived as an abstraction. In today's hyperconnected, hypertransparent world, moral interdependence is inescapable. Recent advances in technology and vast networks of information have fundamentally changed expectations regarding how students should relate to others, both in the classroom and with people in very different cultures, places, and times.

Across centuries, narratives have created the "realization that all of our activities and beliefs spring from stories. Science tells a particular story, so do religions" (Wheatley 1998, 340). In sharing their personal stories with one another, learners create an interpretation of their lives, its purpose, significance, and promise. Martin Luther King was especially gifted in creating and sharing stories of a future state that was different from and better than the current reality (Cherches 2023.) In his *Letter from the Birmingham Jail,* Dr. King dramatized the present so that "individuals could rise from the dark depths of prejudice and racism." The early Christians had nothing but a profound revelatory experience. They did nothing—nothing but wander about telling a new story. Through their simple wanderings, they ignited the transformation of humanity (Swimme and Berry 1992). Profoundly, the stories of both Martin Luther King and the early Christians exhibit a piercing moral resonance for educators and students: Who is worthy of the full expression of their humanity? (Wilkinson 2021)

IV. Conclusion

The recurrent challenge confronting educators in diverse academic settings is how to inspire students to enlarge their circles of moral concern: To become more aware of themselves, more empathic towards others, more tolerant of others' opinions and beliefs, more sensitive to their ecological surroundings, more confident in responding to an ambiguous and changing future, and more willing to embrace diversity, equity, and inclusion in creating collaborative solutions to societal and organizational challenges (Winkler and Pelzmann 2023). In Howard Gardner's (1995) *Leading Minds* we are reminded that it is imperative for educators to know their stories, to get them straight, to communicate them effectively, to overcome the counter-stories that they face, and to embody in their lives the stories that they share with their students in a culture of moral learning. Educators cannot teach a story without first writing and living one dedicated to awakening in learners the moral qualities of the human spirit.

In Victor Frankel's (1959) *In Search of Meaning*, the psychiatrist argues that what is important is not what we expect from life but rather what life expects from us. What life expects from educators and students is to use their words and actions is to make others' lives richer and more significant. In an academic environment, embracing a moral leadership perspective, a commitment to professionalism, values-based governance, and visual imagery that expresses a piercing moral resonance serves to create larger circles of moral concern that affirm the dignity of others and the dignity of the work that others do.

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Exploring Cognitive Skills and Academic Outcomes of Poverty-Affected English Language Learners in Indian Primary Schools

By Swagatika Samantaray & J. P. Das
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Abstract- This study investigates the cognitive performance of primary school children in India who are English Language Learners (ELL) and live in poverty. Cognitive performance was assessed using the Das-Naglieri Cognitive Assessment System (CAS2 was not constructed). There is a scarcity of studies on participants who are both ELL and live in poverty, and many such children are often found to be intellectually deficient. This study examines the performance in PASS measures (Planning, Attention, Simultaneous, Successive) and their correlation with academic achievement, particularly in reading and mathematics. We assessed the performance of 80 primary school students residing in slum areas (mean age: 9.8 years), matched in age and grade with 70 regular school students from areas outside the slum (mean age: 9.11 years). It was hypothesized that ELL regular school students would exhibit average Das-Naglieri CAS scores as per established American norms.

Keywords: cognitive processes, reading, comprehension, math competence, poverty.

GJHSS-G Classification: LCC: LB1131

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Swagatika Samantaray [α] & J. P. Das [σ]

Abstract- This study investigates the cognitive performance of primary school children in India who are English Language Learners (ELL) and live in poverty. Cognitive performance was assessed using the Das-Naglieri Cognitive Assessment System (CAS2 was not constructed). There is a scarcity of studies on participants who are both ELL and live in poverty, and many such children are often found to be intellectually deficient. This study examines the performance in PASS measures (Planning, Attention, Simultaneous, Successive) and their correlation with academic achievement, particularly in reading and mathematics. We assessed the performance of 80 primary school students residing in slum areas (mean age: 9.8 years), matched in age and grade with 70 regular school students from areas outside the slum (mean age: 9.11 years). It was hypothesized that ELL regular school students would exhibit average Das-Naglieri CAS scores as per established American norms. The results show that the ELL students in the slum performed somewhat lower on each of the four PASS scales, but the differences were within half of 1 standard deviation based on American norm tables for CAS. These findings suggest that the protective environment of the school may mitigate the effects of poverty. This favorable school-related climate may be attributed to Bronfenbrenner's (1979) ecological factors and protective school climate. These points are further discussed in the Discussion and Conclusions section.

Keywords: cognitive processes, reading, comprehension, math competence, poverty.

I. Introduction

a) Relevance

We report a study within the framework of a brain-based approach to Intelligence. Specifically we use assessment of Planning, Attention, Simultaneous and Successive(PASS) as a measure of intelligence (Naglieri, J. A., & Otero, T. M. (2018)). PASS provides explanations of cognitive and behavioral expressions of intelligence while its origins remain in physiological levels of brain functions (Das,2018); The brain-based approach does not exclude experience and the cultural environment in which an individual must function We suggest that (1) intelligence should be considered as a conglomeration of cognitive processes for adaptive purpose, that it is not to be defined as IQ, and (2) cognition, unlike IQ, is by nature responsive to learning, be it formal or spontaneously acquired through experience (Das, 2018). Learning links cognitive processes to education because cognitive enhancement can be learned through training (Posner & Rothbart, 2007). Focus on the effect of poverty as a cultural disadvantage delineates changes in the brain due to learning and its dysfunction. Still it is believed that genetics, culture and opportunity are the three major factors that influence intelligence. There is little disagreement at present that gene to culture transmission is a bidirectional process, that it works both ways even at the molecular level. See (Heyes, 2012) Co-evolution "New Thinking: The Evolution of Human Cognition" by Cecilia Heyes. It was published in the journal Philosophical Transactions of the Royal Society B: Biological Sciences. The article discusses the coevolution of human cognition, emphasizing how culture and cognitive processes have evolved together. Heyes argues that many cognitive mechanisms, traditionally thought to be products of biological evolution, are actually shaped significantly by cultural evolution. Key points include: 1. Cultural Inheritance: Cognitive mechanisms are transmitted through social learning, and culture plays a significant role in shaping cognitive development. 2. Cognitive Gadgets: Heyes introduces the concept of "cognitive gadgets," which are mental tools shaped by cultural evolution rather than biological evolution. 3. Interaction of Biology and Culture: The article explores how genetic and cultural evolution interact, proposing that many cognitive traits are a result of this interaction".

Transcription from DNA to RNA is impacted by cultural factors including chronic poverty as a stress response, epigenetic modifications initiated by malnutrition, cultural disadvantage and lack of opportunities for education.

Poverty greatly impacts the resources accessible to students, leading many to fall behind academically compared to children not living in poverty. The influencing key factors which affect student performance include family income, income sources, resources available, home literacy environment etc. Since it is not easy to effect major changes in these conditions widely prevalent among students in poverty, we can provide a school climate that mitigate the impact of poverty by providing teachers as mentors.

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In our study, it was possible to do so as many of the teachers also lived in the same 'slum' area where the school was located. When asked, they said 'if we do not teach our own children, who else would do ?'

This excerpt (Das, J.P.(2018) Brain-Based Approaches to the Study of Intelligence Oxford Research *Encyclopedia of Education Emotion, and Learning*) given below outlines a brain-based approach to understanding intelligence, emphasizing the importance of cognitive processes over traditional IQ measures. The PASS theory (Planning, Attention, Simultaneous, and Successive) is highlighted as a key framework for assessing intelligence. Here are the main points and insights from the text:

b) Key Points

1. Brain-Based Approach to Intelligence
   - Intelligence is viewed as a set of cognitive processes (Planning, Attention, Simultaneous, and Successive) rather than a single IQ score.
   - Cognitive processes are influenced by both physiological brain functions and external factors like experience and cultural environment.
2. Role of Learning and Environment
   - Intelligence is adaptive and can be enhanced through learning and training.
   - Environmental factors, such as poverty, significantly impact cognitive development and academic achievement.
3. Cultural Influence and Coevolution
   - Cultural factors, including chronic poverty, affect gene expression and epigenetic modifications.
   - Heyes (2012) introduces the concept of "cognitive gadgets," mental tools shaped by cultural evolution, suggesting a bidirectional interaction between genetic and cultural evolution.
4. Impact of Poverty
   - Poverty influences student performance through factors like family income, home literacy environment, and access to resources.
   - Schools can mitigate these effects by providing supportive environments, such as teachers from similar backgrounds acting as mentors.

c) Implications for Education

- *Focus on Cognitive Processes:* Education systems should prioritize the development of cognitive processes through targeted interventions and training programs.
- *Supportive School Climate:* Creating a nurturing school environment, especially in impoverished areas, can help bridge the gap in academic achievement.
- *Cultural Sensitivity:* Recognizing the cultural and environmental factors affecting students can lead to more effective educational strategies.
- How to raise the World's IQ –The Economist July 13th—19th 2024

d) The Present Study

We report a study within the framework of a brain-based approach to Intelligence. Specifically we use assessment of Planning, Attention, Simultaneous and Successive (PASS) as a measure of intelligence.

PASS provides explanations of cognitive and behavioral expressions of intelligence while its origins remain in physiological levels of brain functions (Das, Kirby, & Jarman, *1975, 1979;* Das, Naglieri, & Kirby, *1994*). The brain-based approach does not exclude experience and the cultural environment in which an individual must function.

We suggest that (1) intelligence should be considered as a conglomeration of cognitive processes for adaptive purpose, that it is not to be defined as IQ, and (2) cognition, unlike IQ, is by nature responsive to learning, be it formal or spontaneously acquired through experience (Das, 2018). Learning links cognitive processes to education because cognitive enhancement can be learned through training *(Posner & Rothbart, 2007).*

Extensive research has shed light on the cognitive assessment of various functions such as Planning, Attention, Simultaneous, and Successive Processes (PASS measures), particularly in relation to academic achievement, notably in reading and mathematics. However, scant attention has been paid to exploring the influence of poverty on these cognitive processes. Recent scholarly focus has increasingly turned towards understanding the detrimental impact of poverty on education. In our study, we delve into this issue by examining children from a school situated in an urban slum within an Eastern State of India.

i. *Poverty and Culture: The Poverty of Culture Distinguished from Culture of Poverty*

Oscar Lewis (1966) was an American anthropologist known for his concept of the culture of poverty. In his influential work, "The Children of Sanchez: Autobiography of a Mexican Family," (1961) Lewis argued that poverty was not just a result of economic factors but was also perpetuated by a set of values, beliefs, and behaviours that were passed down from generation to generation within impoverished communities.

Lewis suggested that individuals growing up in poverty are likely to develop a particular outlook on life characterized by feelings of helplessness, dependency, and marginalization. This outlook, according to Lewis, becomes ingrained in the culture of the community, reinforcing patterns of poverty across generations.

Lewis has had a significant impact on discussions around poverty and social policy. However, concept of the culture of poverty remains a subject of debate and inquiry in sociology, anthropology, and related fields.

Understanding the culture of poverty allows for a broader perspective on social issues. It reveals that problems traditionally attributed to specific racial or ethnic groups are, in fact, prevalent across various societies. Addressing poverty's cultural aspects requires tailored interventions beyond mere economic assistance. In more developed countries like the U.S., solutions for poverty often involve raising living standards and integrating the impoverished into the middle class.

To mitigate the adverse effects of poverty on academic achievement, schools must create supportive environments. This includes providing basic necessities, offering holistic support services, employing quality teaching methods, integrating social and emotional learning, engaging parents and communities, and advocating for structural change to address inequality. Whether or not these are possible for implementation, remains a topic for discussion.

To address the impact of poverty on academic achievement, it's essential to examine both the school environment and the role of teachers as mentors. In many Indian cities, poverty is synonymous with slums, such as the largest one in Bhubaneswar, the capital of the state of Odisha. Our focus lies on studying children's academic performance within a school located in this slum (who are from low socio-economic status).

The study conducted in a slum where poor families live with limited access to education and health care system and facilities. The children tested for study were considered to be poor on basis of the income of the family. The families are coming under below poverty line (BPL). Below the poverty line refers to individuals or families whose income falls below a certain threshold level, known as the poverty line. This threshold is set by the state Government in Odisha and is typically based on the cost of basic needs such as food, shelter, and clothing. To come under the BPL scheme in Odisha, a family's annual income must be below Rs 40,000 in rural areas and Rs 60,000 in urban areas. All the families living in the slum come under BPL category. Government of Odisha has provided them BPL card examining their income for accessing health facilities, basic education and ration.

The second school outside the slum area is used for comparision. It has students from a wider range of socio-economic background. The course curriculum and the medium of instruction is same as any other Govt. school in Odisha, and the slum school. This school has students from both low and middle socio-economic status.

ii. *The Second Part of the Study Prediction of academic achievement in reading and mathematics associated with PASS processes*

Reading is a complex process and it involves many sub processes (Gough & Tunmer, 1986). The challenges become even more complex for children living in poverty. Prolonged exposure to stress triggers the release of cortisol, a stress hormone that can impair executive functions in children (Blair, Clancy et al.). This impairment often hinders reading acquisition and overall reading development (Evans & Kim, 2007). Numerous studies have established a strong and consistent relationship between poverty and academic achievement (Duncan, Brooks-Gunn, Yeung & Smith, 1998; Guo, 1998; Korenman, Miller & Sjaastad, 1995). Research consistently shows the detrimental effects of poverty on children's reading attainment. Both word decoding and passage comprehension require significant cognitive processing, which can be compromised when cognitive functions are under strain.

So is mathematics ability. Knowledge about digits, randomization, size and estimation are some core elements of mathematics. Children do develop this knowledge along with the letter and phonemic awareness as they begin to go to school and start learning different concepts. Thus, growing up in poverty is presumed to have a negative impact on the cognitive predictors for reading, comprehension and mathematical ability.

iii. *PASS processes and Relation with Reading, Comprehension and Math*

Here is a brief review of cognitive processes which predict reading, comprehension and mathematical ability in children, followed by a report of an investigation. The study examines the structure of the relationship between cognitive processes on the one hand and Reading and Math competence on the other within a neurocognitive framework, the Planning, Attention, Simultaneous and Successive processing (PASS). A comprehensive review is given in the following abstract

Georgiou, G., Guo, K., Naveenkumar, N., Vieira, A. P. A., & Das, J. P. (2020). PASS theory of intelligence and academic achievement: A meta-analytic review. *Intelligence, 79*, 101431.

In short, the following is an informative abstract of the results of the meta-analysis:

> *……how well the PASS processes relate to academic achievement?. Thus, this study aimed to determine their association by conducting a meta-analysis. …. data from 62 studies with 93 independent samples revealed a moderate-to-strong relation between PASS processes and reading, r = 0.409, and mathematics, r = 0.461]. Moderato analyses further showed that (1) PASS processes were more strongly related to reading and math in English than in other languages, (2) Simultaneous processing was more strongly related to math accuracy and problem-solving than math*

fluency, (3) Simultaneous processing was more strongly related to problem-solving than Attention, and (4) Planning was more strongly related to math fluency than Simultaneous processing. Age, grade level, and sample characteristics did not influence the size of the correlations. Taken together, these findings suggest that PASS cognitive processes are significant correlates of academic achievement, but their relation may be affected by the language in which the study is conducted and the type of mathematics outcome. They further support the use(They further support the use of intervention programs that stem from PASS theory for the enhancement of reading and mathematics skills. (permission for quote obtained from George K. Georgiou.

Long before the meta-analysis study mentioned above, Long before the meta-analysis study mentioned above, Das, Kirby, and Jarman (1979), as well as Das, Naglieri, and Kirby (1994), established specific links between PASS processes and word reading. They proposed that successive processing contributes to word reading through phonological processing (sounding out words), while simultaneous processing aids word reading through orthographic processing. When children are learning to read, word recognition is often achieved through phonological recoding. This process involves identifying individual letters in words, recalling their corresponding sounds, storing these sounds in short-term memory, and finally blending them in a serial or successive order—steps that describe successive processing.

Familiar words, on the other hand, can be read by sight without the need for phonological recoding, thanks to orthographic knowledge. Orthographic processing involves simultaneous processing; for example, distinguishing between phonologically similar words requires simultaneous comparison to determine the correct spelling (e.g., "rain" vs. "rane"). Research has shown that children with reading difficulties often have significant deficits in both simultaneous and successive processing (Das, Naglieri, and Kirby, 1994). For instance, in a study by Das et al. (2007) involving Grade 3 and 4 English-speaking children, it was found that the probability of a child being a poor reader was 0.75 if their standard score in successive processing was below 80. The corresponding probability for simultaneous processing was 0.50.

PASS processes have also been linked to reading comprehension (e.g., Das, 2009; Georgiou & Das, 2014). Understanding a story requires children to grasp the relationships among the facts presented, which necessitates good simultaneous processing to integrate the main ideas in sentences. Additionally, planning and attention are crucial for reading comprehension. To effectively comprehend a passage, a reader must develop and actively revise a plan for approaching the text. Earlier work by Das et al. (1982) found that both planning and simultaneous processing were significant predictors of reading comprehension in fourth- and sixth-grade English-speaking children. More recent research has extended these findings, showing that simultaneous processing uniquely affects reading comprehension beyond the contributions of word and text-reading fluency (Georgiou & Das, 2014). Of course, working memory is indispensable for comprehension.

In the course of development in general and reading development in particular in children, poverty plays an important role. It has been argued that home literacy environment is one of the key factors for better reading development and academic achievement (Manolitsis, G, et al., 2011). In the present study, participants were from poor families. The study was conceptualised to examine different cognitive factors predicting different aspects of reading development. One of these was to compare the predictability of the cognitive factors for reading development and mathematic ability in typically developing children and children living in poverty. Apart from the environmental factor, we asked if in both groups of children, the same cognitive factors predict reading and mathematics ability.

The Present Study has the Following Objectives:

- To examine if PASS cognitive processes, assessed by CAS are significantly below the original American norms, same as in CAS.
- To identify the CAS cognitive processes that predict reading, comprehension and mathematical ability in children given that they are English language Learners (ELL),
- If CAS performance can predict achievement scores in Reading, Comprehension and Math (in English) of students in Grades 4 & 5.
- A comparison of cognitive and academic achievement of students in a typical school outside the slum.

II. Method

a) Participants

The study was conducted in Bhubaneswar Odisha, an eastern state of India. All children participated in the study were from a school in an extremely low economic area of the city. They were chronically poor. However, all of them were given free uniforms to wear to school. The school was clean and provided good sanitary facilities in contrast to the surrounding 'slum'. Discipline was not a problem and comparable to even schools in better socioeconomic areas. Teachers had requisite college education, and most lived in the same area where the school was located. They were exceptionally dedicated in spite of their low salaries compared to other schools. These factors might have mitigated and reduced the effect of chronic poverty on the children's academic learning.

The study included 80 pupils from grades four and five. Among them, 35 were girls and 45 were boys. The pupils were selected from a public school in

Odisha, where the medium of instruction was Odia. The school was selected on the basis of its language of instruction. The mean age for the sample was 9.8 years. The initial literacy instruction for the sample was Odia. However, they were introduced to English at an early age in school, when they usually begin to read. The approximate age would be five years when they start learning to read in English. The school uses Odia (native language) as the medium of instruction like the majority of schools do but English is taught as a subject. The school, as mentioned above, is located in the city's slum where all students live in poverty.

The children participated (Mean age 9.11 years) for the comparative study, who were not poor. They were from a private school, maintaining a high standard of principles and morale. This school is situated in the same city in an urban locality outside the slum area.

The medium of instruction for other subjects taught in the classroom was Odia and English is taught as a subject. The two-school followed simple methods for both languages, which were predominantly look and say, as is the practice in typical Odia-medium schools.

b) Measures

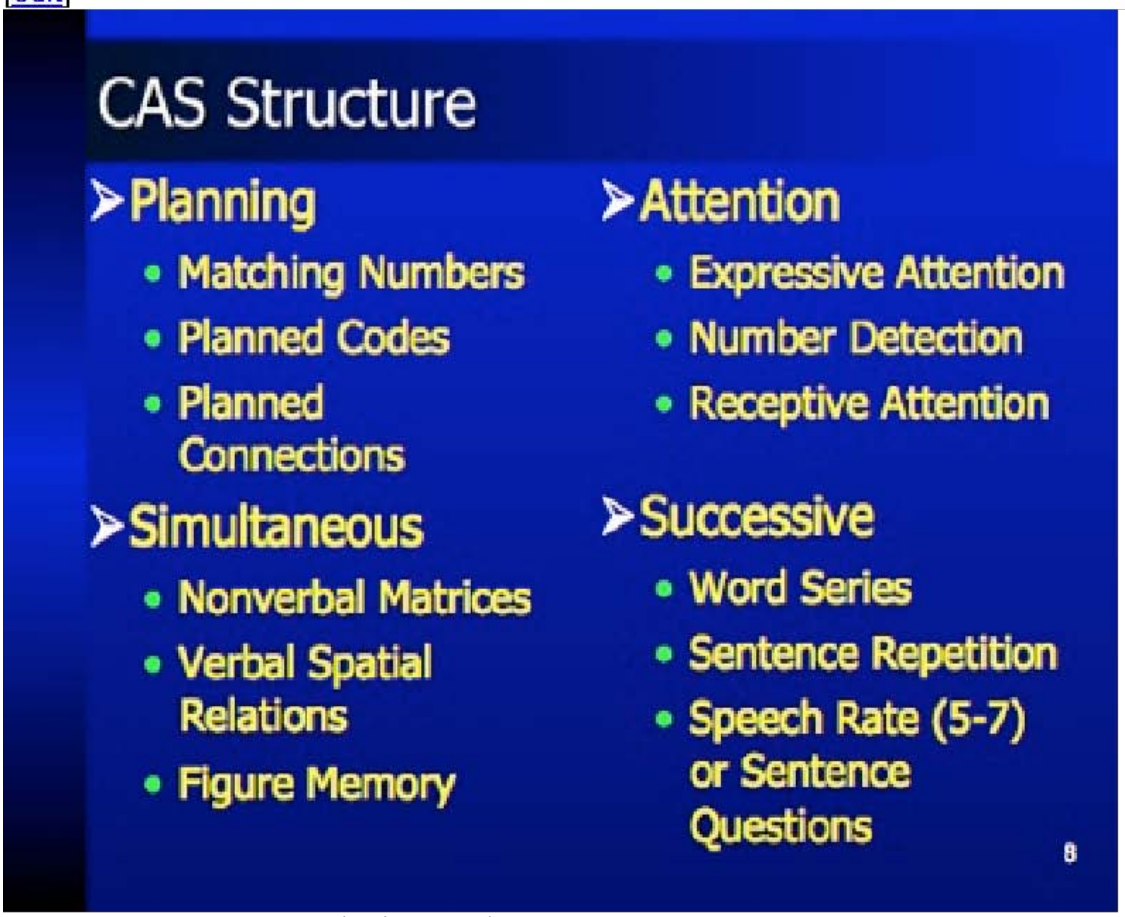
The study was designed to assess children's word reading, reading comprehension, cognitive and mathematical abilities. Word reading and Reading comprehension in English were assessed by Woodcock Johnson Test Battery. In addition, cognitive abilities of the children were assessed using Das-Naglieri Cognitive Assessment System (Naglieri & Das 1997). Mathematical problem solving and mathematical fluency were tested using WAIT- III.

Woodcock Reading Mastery Test: This test battery has test for word reading and reading comprehension in English. In word reading there are 106 items and the level of complexity increases with number of items. Basically, the words vary from high frequency to low frequency. The child is allowed to look to the word and say it out loud. The test stops at four consecutive errors. The reading comprehension test has 56 items and like word reading, the level of complexity increases with the number of items. The principle for stopping the test is same as word reading. The parallel test for word reading and reading comprehension in Odia follows the same norm and difficulty levels in items. The test administration and instructions were same for both the English and Odia tests.

- CAS is a system of assessment of 'processes', not abilities. Ability tests such as WISC/WAIS
- those that measure fluid and crystallized abilities address different constructs than process assessments. CAS process measures may have the same contents in several of its sub-tests (i.e. verbal, as in Simultaneous Verbal, and Word-series, see next section) but the codes are different (Simultaneous contrasted with Successive. see McCrea 2009[8] for further discussion).

The CAS battery

[edit]



Cognitive process subtests in the CAS battery

The CAS standard battery consists of three subtests for each PASS Scale (12 subtests in all) whereas the basic battery has 2 subtests for each scale (8 in total).The last test in each scale is dropped in basic battery. It takes an hour to administer the standard battery and 40 minutes for the basic battery (Naglieri & Das, 1997[9]).

The CAS basic battery provides a standard score for each process as well as a Full Scale standard score. The average internal reliability coefficients across ages 15–17 for the PASS scales are:

Das-Naglieri Cognitive Assessment System (CAS2 was not yet available): The CAS is an assessment battery designed to evaluate cognitive processing. It was developed to integrate theoretical and applied areas of psychological knowledge using cognitive processing theory and tests designed to measure—Planning,

Attention, Simultaneous, and Successive Processing (PASS)—in individuals ages 5–17. CAS is based on Luria's PASS model. The Planning, Attention, Simultaneous and Successive (PASS) cognitive processing model is a modern theory as it is based on Luria's analyses of brain structures (1966b; 1973). The model looks at information processing as dynamic instead of static. Children were administered 2 tests from each aspect, thus, giving a total of 8 tests for all the 4 components of cognition. The subtests for planning are matching numbers and planned codes. Expressive attention and number detection are the subtests for attention. The subtests for simultaneous processing are non-verbal matrices and verbal spatial relation. And the subtests for successive processing skills are, word series and sentence repetition. For details of the subtests of CAS and elaboration, please see *Das-Naglieri Cognitive Assessment System Interpretive Handbook* (Naglieri & Das 1997).

A recent paper on the history of CAS and PASS Theory is given in *The PASS View of Intelligence,* (Das & Kirby, 2022). We see intelligence as a cluster of cognitive processes that support individuals and groups in attaining goals and adapting to challenges. These processes are neurologically based, but this does not exclude roles for experience and the individual's cultural environment (Das, 2018). These processes are in principle responsive to development and learning, both spontaneously through experiences, and formally through instruction (Vygotsky, 1934, 1978).

WAIT-III: WAIT is a comprehensive test battery to assess a wide range of mathematical abilities through different kind of tests. Mathematical fluency and Mathematical problem solving are two among them. In the fluency test, the child needs to do a set of (contains 16 items) mathematical addition, subtraction, division and multiplication. The number of correct responses is the scores. On the other hand, problem solving has 70 items. They are mixed of kinds i.e.; matrices, spatial relation tasks and small comprehensive sums. The complexity of items increases with the number of items. The child has to understand the question and answer seeing the pictures or reading the question given in the task. The rule to stop the test is four consecutive errors.

c) Ethical Consideration

Before collecting the data, an ethical approval was obtained from the principal of the school, since the study required the involvement of school children. Initially a request was made to the principal of the school for the study. After getting the permission from the principal, the selection of participants was made after seeking their parental consent. All the pupils were briefed about the method and purpose of the study. They were also told that they were free to withdraw from the study any moment they want.

d) General Procedure

The studies were conducted in Bhubaneswar Odisha. After selecting the schools and children for the study, the children were briefed about the tests they were going to take. Each child was taking the whole set of tests in two different days to reduce the effect of fatigue and boredom. Each child was tested for 110 minutes approximately in total. The same child got a day break between the tests' day. The principals of the school were kind enough to provide the researcher with a quiet room for the tests. Before starting the tests, the researchers introduced themselves to the child and explained the child's importance in the study. Test administration began after establishing rapport with the child. It was prudently taken care that the child did not feel uncomfortable during the tests and continuous encouragement and positive feedback was given to each child during the tests. Before each test the child was given precise instructions and examples for the tests. The set of instructions for each test was provided in Odia with a mixture of English to promote easy understanding. A short meeting was also done with the parents in the first group of students, briefing about the objective of the study and every student was made clear that they may leave the study if they want at any point of time.

III. Result Analysis and Discussion

Table 1 shows the mean and standard deviation for all PASS components along with decoding, comprehension and math competency in poor children. Individual PASS scores indicate an average ability except in successive processing skill. The potential reasons of deficit are discussed later in discussion section. Additionally, skills in decoding, comprehension and math competency are explained in discussion section.

Similarly, Table 2 illustrates the mean and standard deviation for all PASS components along with decoding, comprehension and math competency in non-poor children. The scores in the table clearly show a difference in each individual PASS components along with decoding, comprehension and math competency skill. However, successive processing skill in non-poor children is also lower in comparison to the other individual PASS components. Successive processing skill found to be weak in the meta-analysis of PASS components. It could be presumed that lack of exposure to English language, medium of instruction in the school and poor home literacy environment are the possible reasons weakening the successive processing in the study. These determining factors are explained at a length in this result and discussion section.

Table 1: Mean and Standard Deviation of PASS Components, Decoding, Comprehension and Math Competency of the participants Assessed using Cognitive Assessment System, Woodcock Johnson Reading Battery and WIAT-III respectively (N= 80). *Poor Slum School*

Poor Children	*Means*	*SD*
Planning	91.75	10.86
Attention	90.67	11.10
Simultaneous	98.58	15.74
Successive	85.36	11.61
Decoding	36.85	17.01
Comprehension	05.47	03.65
Math Competency (Fluency)	37.63	14.18
Math Competency (Problem Solving)	39.07	05.88

Note: PASS Simultaneous standard score is exactly average. Planning and Attention are only one and half SD lower. Successive score reflects poor English proficiency, and examiner's effort to 'rescue' some of the participants to understand English as and when necessary.

Table 2: Mean and Standard Deviation of PASS Components, Decoding, Comprehension and Math Competency of the participants Assessed using Cognitive Assessment System, Woodcock Johnson Reading Battery and WIAT-III respectively (N= 70). *School Outside the Slum*

Non- Poor Children	*Means*	*SD*
Planning	105.88	21.48
Attention	108.58	01.76
Simultaneous	100.94	10.70
Successive	97.81	16.21
Decoding	44.52	18.61
Comprehension	18.77	16.29
Math Competency (Fluency)	88.24	15.45
Math Competency (Accuracy)	32.44	03.99

Note: PASS scores are average or over average (except Successive). This is for Non poor children.

The result of the study for poor children were unanticipated; evidence of mitigated poverty. Most likely a compelling evidence of favourable school climate. This is best explained by invoking the ecological notion of Bronfenbrenner.

Generally, it is expected that the impact of poverty will supress the cognitive as well as the reading skills of ELL students living in poverty Also, poor children are expected to exhibit poor academic achievements. The exception to this was the average PASS scores except successive processing skill. Here the question arises, what could be the possible mitigating factors for reducing the impact of poverty on their cognitive skills. In the introduction section we have explained about the climate of the school and role of teachers, we have explained about the motivating school environment and group of dedicated teachers who not only teach to educate the children of their own community, but they teach to build confidence and achieve academically. These teachers eventually have become their mentors. These are the rescuing factors to reduce the impact of poverty on their cognitive development and reading achievement.

Table 3, 4, 5, and 6 illustrate the age and grade equivalent score for decoding and comprehension in both poor and non-poor children. Comparing the age and grade between groups gives a picture of difference in performance. However, the difference in age can't be considered to be a reliable one because in India age is often manipulated at the time admission in the school. The manipulation in age is even more common in poor children since they don't have a proper birth certificate to produce. In that case, we take the grade equivalent score as the reliable score to measure the skill.

Besides, the test battery we used to assess the decoding and comprehension in children follow an American norm. Which further widens the gap between the chronological age and obtained reading age, and similarly between the normed grade and obtained grade. In both the poor and non-poor groups children are lagging behind in their grades from their original grade. Although the difference between the groups is not very wide, but it opens up the scope for discussion about the associated factors.

Table 3: Mean of Age Equivalent Score for Word Reading of the participants Assessed using Woodcock Johnson Test Battery (N= 80 and N= 70 respectively in each group)

Groups	*Means*	*SD*
Poor Children	7.19	1.66
Non-Poor Children	8.08	1.86

Table 4: Mean of Grade Equivalent Score for Word Reading of the participants Assessed using Woodcock Johnson Test Battery (N= 80 and N= 70 respectively in each group)

Groups	*Means*	*SD*
Poor Children	2.18	0.94
Non-Poor Children	2.88	01.80

Table 5: Mean of Age Equivalent Score for Reading Comprehension of the participants Assessed using Woodcock Johnson Test Battery (N= 80 and N= 70 respectively in each group)

Groups	*Means*	*SD*
Poor Children	05.88	01.23
Non-Poor Children	08.53	06.11

Table 6: Mean of Grade Equivalent Score for Reading Comprehension of the participants Assessed using Woodcock Johnson Test Battery (N= 80 and N= 70 respectively in each group)

Groups	*Means*	*SD*
Poor Children	01.17	0.63
Non-Poor Children	02.73	03.03

Table 7 depicts the math competency in both poor and non-poor children respectively. The means of both the groups revealed great difference in math competency. The variance is wide enough for an attempt to understand the underpinning factors associated with the skill level. The particular skill (math fluency) is measured through additions and subtraction in different difficulty level, needs digit knowledge, comprehension skills, information processing skill (speed component) as cognitive factors and familiarity and practice of simple equations in daily life as an individual and social factor. The role of home environment, exposure to basic transaction and calculation play a vital role in stimulating the competency of calculation in children.

We often learn basic concepts of mathematics like addition and subtraction from our family members before we go for formal education in school. The foundation of mathematics begins from home. More we talk about numbers and equation the more we gain the familiarity and practice with them. Only digit knowledge can't contribute significantly for developing knowledge on mathematical equation. Displaying a low score in math competency, poor children have raised interest to investigate every potential factor pulling back these children from acquiring a fair competency in mathematics.

Table 7: Mean of Math Fluency Score of the participants Assessed using WIAT -III Test Battery (N= 80 and N= 70 respectively in each group)

Groups	*Means*	*SD*
Poor Children	37.63	14.18
Non-Poor Children	88.24	15.45

Additionally, by taking children living in poverty has squeezed the diversity with regard the socio-economic status is concerned. Non-poor children belong to a group where the socio-economic status is wider and the distribution is spread. Thus, the result we obtained from the non-poor is more reliable than the poor children. To examine the significance of the difference that we found between the groups, we conducted a t-test for math fluency and the results is presented in Table 8. The difference between the groups found to be significant at .05 level (t (148) = -20.91, p = 0.22).

Table 8: Summary of t-test results for Math Fluency scores in both the poor and non-poor groups (N= 80 and N=70 respectively)

$Mean_a$—$Mean_b$	*t*	*df*	*p* value	Significance level
-50.60	-20.91	148	0.22	.05**

The t (148) = -20.91, p = 0.22. The result is significant at p < .05.

However, the focus of the paper was not on the performance of mathematics in both the groups but on PASS factors and how PASS components are predicting decoding, comprehension and math ability in children. Prior to investigating the PASS predictors for decoding, comprehension and math in this study, we checked the mean score of each skill. The reason why we didn't go for a regression analysis for decoding and comprehension is simply the low scores in each area. Examining the cognitive predictors for decoding, comprehension in this particular study would not suffice the literature to build a reasonable connection between the distal and proximal factors. Since we have found a significant difference in math competency in children, a regression analysis was done to examine the PASS predictors for math competency in both the groups.

Table 9 and 10 show the PASS predictors for math competency in both poor and non-poor children.

Table 9: Summary of regression analysis results for PASS measures predicting Math Fluency scores in the poor children (N= 80)

PASS	B	Std. Err	Beta	t	Sig.
Planning	.14	.15	.32	2.75	.00
Attention	.56	.13	.04	.40	.68
Simultaneous	.36	.10	.40	3.56	.00
Successive	-.15	.12	-.12	-1.17	.24

Note: The Dependent Variable is Math Fluency and as expected Planning and Simultaneous Processing Skills are the predictors for Math Competency.

Table 10: Summary of regression analysis results for PASS measures predicting Math Fluency scores in the non- poor children (N= 70)

PASS	B	Std. Err	Beta	t	Sig.
Planning	.11	.08	.15	1.36	.17
Attention	.33	.12	.31	2.61	.01
Simultaneous	-.04	.16	-.02	-.24	.80
Successive	-.20	.11	-.21	-1.86	.06

Note: Math Fluency measures accuracy and speed of calculation. Attention is the salient variable.

The regression analysis was done to examine which PASS component (s) predict the math fluency in children the most. Table 9 shows the regression analysis for poor children and table 10 shows the analysis for non-poor children. In case of poor children Planning (*Beta* = .32, *p* = .00) and Simultaneous processing skills (*Beta* = .40, *p* = .00) found to be predicting math competency as anticipated. However, Attention (*Beta* = 2.61, *p* = .01) is the salient variable for math fluency in non-poor children.

IV. Discussion & Concluding Remarks

Poverty greatly impacts the resources accessible to students, leading many to fall behind academically compared to children not living in poverty. The influencing key factors which affect student performance include family income, income sources, resources available, home literacy environment etc. (Lacour, M., & Tissington, L. D., 2011). In the present study, despite the trend of lower assessment scores among students from economically poor backgrounds, effective instructional methods, positive school environment and mentorship of the teachers have helped bridge the achievement gap by offering essential support for these students to excel academically.

The zone of proximal development (ZPD) Vygotsky, describes the range of skills an individual can achieve with expert guidance but is not yet able to accomplish independently. Vygotsky (1978), in his theory explains, this can be seen in classroom environments or any situation where a person has the chance to learn new abilities.

In our study, in the so—called 'slum school', the teachers have played an important role nourishing the students' mind with values, enthusiasm and hunger for academic achievement. The teachers' guidance and

support have enabled the students to perform better than the typical trend which poor children show.

In conclusion, we strongly emphasize the role of school atmosphere, based on Bronfenbrenner's framework. Resilience can be cultivated during childhood through the intricate social interactions children have with their parents and teachers within the microsystem (Bronfenbrenner, U. 1979). Emphasizing microsystem of the children, he meant the immediate environment i.e.; family and school.. Teachers who are the mentors for these children have contributed towards mitigating the impact of poverty to an extent. However, the results can best be viewed as an inspiring way to moderate the impact of poverty on children's education. In India to eradicate poverty huge and widespread as it is, is not an easy task at this point of time. Empowering families to provide a conducive learning environment is also dependent on several other complex factors—economics and cultural factors(see The Economist July 2024). The attainable task is to groom teachers as mentors who can actually change the academic trend found among children living in poverty.

Bonfrenbrener: School Climate

A recent article presents a practical application of Ecological. View of Bonfrenbrener Mitigating the effect of family poverty on academic and behavioral outcomes: The role of school climate in middle and high school Laura M. Hopson a, ∗, Eunju Lee b, 1a University at Albany, School of Social Welfare, 135 Western Avenue, Richardson Hall, Room 207, Albany, NY 12222, United States b University at Albany, School of Social Welfare, 135 Western Avenue, Richardson Hall, Albany, NY 12222, United States. *Mitigating the effect of family poverty on academic and behavioral outcomes: The role of school climate in middle and high school.*

- November 2011
- Children and Youth Services Review 33(11): 2221-2229
- DOI: 10.1016/j.childyouth.2011.07.006
- The present study examines associations between family poverty, social supports, students' perceptions of school climate, behavior, and grades. Poverty is associated with poor grades and behavior, while positive perceptions of school climate are associated with positive grades and behavior. Perceptions of school climate moderate the association between poverty and behavior, such that students from poor families who perceive a positive school climate exhibit similar behaviors to their peers from higher income families. Implications for practice, policy, and research are discussed.© 2011 Elsevier Ltd.

What are the components of school climate that mitigate the effect of poverty on academic achievement.

The components of school climate that can mitigate the effect of poverty on academic achievement include:

1. *Supportive Relationships:* Creating a school environment where students feel supported by teachers, administrators, and peers can significantly impact academic achievement. Positive relationships can help buffer the negative effects of poverty by providing students with emotional support, encouragement, and a sense of belonging.
2. *High Expectations:* Setting high academic expectations for all students, regardless of their socioeconomic background, can empower them to strive for success. When students believe that their teachers and school believe in their potential, they are more likely to perform well academically, despite the challenges they may face outside of school.
3. *Safe and Inclusive Environment:* Schools that prioritize safety and inclusivity foster a conducive learning environment for all students. When students feel safe at school, they are better able to focus on their studies and engage in learning activities. Inclusive environments also ensure that every student feels valued and respected, regardless of their socioeconomic status.
4. *Quality Teaching and Learning:* Providing high-quality instruction and engaging learning opportunities is essential for supporting academic achievement, particularly for students from low-income backgrounds. Effective teaching practices, differentiated instruction, and access to resources can help level the playing field and ensure that all students have the support they need to succeed academically.
5. *Family and Community Engagement:* Building strong partnerships between schools, families, and communities can enhance student outcomes, particularly for students facing poverty-related challenges. When families are actively involved in their child's education and schools collaborate with community organizations to provide additional support services, students are more likely to thrive academically.
6. *Positive School Culture:* Cultivating a positive school culture characterized by respect, empathy, and a focus on continuous improvement can have a profound impact on student achievement. When schools prioritize positive behaviors and celebrate successes, they create an environment where all students feel valued and motivated to excel academically.

By addressing these components of school climate, educators and policymakers can help mitigate the effects of poverty on academic achievement and promote success for all students, regardless of their socioeconomic background.

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The Mother of Your Mothers Mother, Her Daughters, and the Disincarnation of the Phallus

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Introduction- Oromance histórico europeu tem o seu surgimento enraizado na origem do próprio romance como gênero e, portanto, ele nasce do comprometimento daquele com o nacionalismo. Ao longo de séculos de produção literária desse subgênero, a teoria elaborou e revisou conceitos, na ânsia de estabelecer os limites entres as disciplinas convocadas para essa criação narrativa. Nesse sentido, o ensaio *O romance histórico*, de Georges Lukács, publicado em 1937, propõe uma primeira reflexão sistemática acerca da produção literária que genuinamente poderia receber esta classificação.

No Brasil, até o século XVIII não se reivindicava um ideal nacionalista, nossa formação enquanto nação advém exatamente da dominação de uma cultura letrada e histórica – no sentido de possuir uma historiografia – sobre culturas originárias nas quais a memória era a garantia de coesão do grupo. Desta forma, não havia, em nossa sociedade um arquivo que pudesse ser mobilizado para a criação do que Lukács acreditava ter como objetivo figurar a grandeza humana na história passada.

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The Mother of Your Mothers Mother, Her Daughters, and the Disincarnation of the Phallus

A Mãe da Mãe de Sua Mãe, Suas Filhas e a Desencarnação do Falo

Patrícia Ferreira Alexandre de Lima

Introduction

O romance histórico europeu tem o seu surgimento enraizado na origem do próprio romance como gênero e, portanto, ele nasce do comprometimento daquele com o nacionalismo. Ao longo de séculos de produção literária desse subgênero, a teoria elaborou e revisou conceitos, na ânsia de estabelecer os limites entres as disciplinas convocadas para essa criação narrativa. Nesse sentido, o ensaio *O romance histórico*, de Georges Lukács, publicado em 1937, propõe uma primeira reflexão sistemática acerca da produção literária que genuinamente poderia receber esta classificação.

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O que queremos chamar a atenção com essa breve contextualização acerca do romance histórico é que toda obra literária pode ser lida como histórica, posto que inscrita em um contexto sócio-histórico, entretanto, esta análise propõe a leitura de *A mãe da mãe de sua mãe e suas filhas* como romance histórico porque a narrativa constrói um imaginário para o cotidiano das mulheres que narra, sendo as histórias enredadas a fatos históricos que nos constituem como nação. Maria José Silveira mobiliza um arquivo e, a partir do que sabemos acerca da história do Brasil e da história das mulheres, é perfeitamente possível imaginar que as vidas dessas personagens existiram.

Obviamente não estamos abordando romance histórico como o definiu Lukács, mas no que se transformou o subgênero, a partir da sua inserção na dinâmica social e na historiografia que, cada vez mais, narra as minorias e as vozes que outrora foram caladas.

Em seu artigo "Repensando o romance histórico", Marilene Weinhardt chama a atenção para "as dimensões do hibridismo que caracteriza a ficção histórica", de acordo com a autora que há décadas se dedica ao estudo da ficção histórica no Brasil:

> À vista do conjunto dessas quase quatro décadas, é perceptível o período de ascensão da modalidade na produção nacional, o prolongamento acompanhado de modificações, e a curva descendente, nos últimos anos, do número de lançamentos de romances que dialogam com a história (WEINHARDT, 2019, p. 321).

À medida que identificamos a diminuição de publicações de romances históricos encontramos proporcionalmente e progressivamente mais mulheres publicando obras nesse subgênero, mas desprovidas de muitas de suas características ditadas pela teoria, como o afastamento do tempo histórico, definido por Lukács e a presença de um evento histórico maior e fundador da narrativa, apontado por Jameson, porém, aproxima-se muito de características também citadas por esse, referindo-se à obra de George Eliot, em que

> [...] o gênero (feminino) certamente constitui aqui um traço de originalidade em relação ao modelo de Scott [...] George Eliot – se não chega exatamente a alcançar a ironia imparcial dos romances históricos posteriores – busca neutralizar esse conflito histórico e remover dele o dualismo ético; procura reencená-lo de tal modo que ele não mais veicule a carga moral de vilões e de heróis virtuosos, mas avance em direção a uma diversa visão da história, uma visão ainda ética no sentido da obra posterior de Eliot, mas que, tal como nessa obra posterior, renuncie a qualquer conceito do mal em favor de uma concepção diversa e muito mais moderna (JAMESON, 2007, p. 188, grifos do autor).

A análise de Jameson poderia ser sobre *A mãe da mãe de sua mãe e suas filhas*, obra que rompe com a disposição desse dualismo heróis e vilões e apresenta suas personagens de forma complexa, com suas virtudes e fraquezas, seres situacionais, fracionados, em construção. Assim, acreditamos que o romance histórico clássico, dadas as suas "dimensões híbridas" já citadas, faz uma curva em seu trajeto de ficcionalização da história, incluindo-se aqui a história de literatura, e se aproxima do que Carlos Reis define como romance de família:

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> Conforme a expressão *romance de família* sugere, este é um *subgênero narrativo* cuja ação se centra no trajeto de um agregado familiar entendido como eixo de referência de um percurso coletivo, normalmente desenvolvido ao longo de um tempo muito amplo. Nesse percurso, observa-se a evolução da família, no fluir de várias gerações que se sucedem, representadas por figuras destacadas em cada uma dessas gerações; quase sempre o romance de família estabelece relações entre as personagens mais destacadas e os acidentes históricos, os fenómenos sociais e os cenários culturais que enquadram a ação (REIS, 2018, p. 439, grifos do autor).

O fato de encontrarmos um número significativo de obras escrita por mulheres e que podem ser lidas como romance de família, faz-nos pensar em uma escrita feminina de romance histórico, aqui abordando o feminino para além de uma ideia sexualizante e redutora da escrita.

Em "O que é escrita feminina", Lúcia Castello Branco aponta para uma dicção e um ritmo próprios, além da presença do corpo nos textos de autoria feminina, salientando que "o feminino não é a mulher, mas a ela se relaciona. Sugere-se que o feminino é o não-masculino, mas a ele não se opõe." (BRANCO, 1991, p. 27). Percebemos, pelas implicações do que propõe a autora, a dificuldade de se estabelecer os limites do que pode ser tido como uma autoria feminina, podendo-se inclusive, nesses termos dispostos, ser atribuída a textos escritos por homens. Porém, na conclusão desse mesmo texto, encontramos uma chave de leitura pela qual nos parece ser possível lançar luz sobre a questão. Lúcia Castello Branco ao analisar o aforismo lacaneano "Não há A Mulher", conclui:

> Ao construir esse aforismo, Lacan pretende fazer menção à ausência de uma inscrição, à ausência de um significante no inconsciente que nos fale do *feminino*. Porque o inconsciente se marca por *traços* e os *traços* apontam sempre para presenças e não para *ausências* [...] O *feminino* define-se, então, por uma não-presença, por ser alguma coisa de ordem do não-fálico, embora não exatamente oposta e simétrica ao fálico (BRANCO, 1991, p. 27, grifos da autora).

Assim, acreditamos que uma escrita de autoria feminina caminha no sentido de desencarnação do falo, construção essa encontrada na obra de Maria José Silveira. A autora desdobra as identidades femininas que narra, sendo as suas carnes superfícies de registro. Os corpos que reagem às experiências retém em suas memórias o que foi vivido e reverberam nas gerações seguintes, seguindo uma lógica íntima que se afasta do que simboliza o fálico como presença, desencarnando-o. O livro, que teve sua primeira edição no início dos anos 2000, rompe padrões ao apresentar a linhagem feminina de uma família, quando a norma é que a constituição familiar de antepassados, inclusive de sobrenomes, se dê a partir dos homens.

A primeira personagem, Inaiá, de origem tupiniquim, nasce com a chegada dos primeiros portugueses à Região de Porto Seguro/Bahia, muito jovem decide partilhar sua existência com o português Fernão, seguem rumo à Feitoria de Cabo Frio/Rio de Janeiro, com mais duas irmãs de Inaiá e um amigo de Fernão, é ela quem ensina Fernão a vivência na mata. Embora possamos facilmente supor a condição de violência sexual a que muitas de nossas ancestrais foram submetidas, e o próprio romance nos lembra disso: "Os motivos que fizeram as índias deixarem sua tribo, quem vai saber? Podem ter ido apenas pelo prazer da aventura, ou talvez tenham ido mais ou menos forçadas [...]" (SILVEIRA, 2018, p. 24), Inaiá é livre e atenta aos desígnios do seu próprio corpo, da sua natureza.

Sua filha, Tebereté, é raptada pelos tupinambás que assassinam Inaiá e Fernão. Ela vive como filha do cacique, é livre, como a mãe, dentro da cultura que percebe e a significa. Recebe do pai a função de ser "esposa" do prisioneiro Jean-Maurice. Tebereté deve alimentá-lo e vigiá-lo até o momento do ritual de canibalismo praticado por sua tribo. A jovem indígena diverte-se com seu prisioneiro, o que em nossa cultura poderíamos chamar de jogos e brincadeiras lhes são inteiramente permitidos, inclusive o contato sexual. Quando Jean-Maurice é degustado pela tribo de Tebereté, ela está grávida de Sahy. Registramos ainda que no final do livro, a autora informa que Tebereté foi inspirada na história do viajante Hans Staden, capturado e feito prisioneiro pelos tupinambás.

As narrativas dessas duas primeiras mulheres da linhagem são contadas em um capítulo que recebe o nome de "Brevíssimo encanto", observamos como as indígenas, mãe e filha, experimentam a liberdade de ser e de existir sem a internalização de gêneros como sendo algo natural, de fato, um encanto, que se foi quebrado por suas mortes precoces, continuará reverberando no desejo de suas descendentes de lutar por um mundo diferente do que o que lhes é oferecido como destino.

O segundo capítulo, intitulado "Desolada amplidão", apresenta as histórias de seis mulheres. Essas personagens, que têm a sua descendência fincada em culturas originárias, são ficcionalizadas em um contexto social em que impera o domínio masculino. O que Maria José Silveira promove, por meio de sua escrita, é apontar as possibilidade de ser dessas mulheres, ser apesar do falo, ser combatendo um poder patriarcal, que se podia claramente sentir, e fadado à decadência desde a sua instituição.

O sentimento de desolação começa a ser sentido por Sahy, filha de Tebereté, que é perseguida e raptada para ser vendida por Vicente Árcon, um mercador que comercializava indígenas no porto da baía de Todos os Santos. Sahy é "maruana" que

corresponderia a uma pessoa com sensibilidade aguçada, capaz de sentir o passado e o futuro. A desolação em Sahy produz-lhe um enunciado de silêncio.

> De certa maneira, naquele exato momento, para se sentir e saber que era mais do que mero animal, ela ultrapassou a revolta que previu impotente e a tristeza que sabia inútil e passou para o patamar em que depois sempre ficou, o patamar de onde aceitava e via o mundo como impassível observadora da infinita capacidade humana para causar dor (SILVEIRA, 2018, p. 44).

Ela é uma mulher que não pertence à comunidade de escravizados na fazenda onde habita, muito menos pertence a casa grande onde trabalha. Ela recebe visitas íntimas de Vicente Árcon e de outros homens, e é julgada por isso. Teve vários filhos homens, todos morreram, e Filipa com quem estabelece uma profunda relação. Filipa, assim como a mãe, é vendida como escrava, aos 10 anos de idade, para um engenho no Recife. Sahy morre de tristeza, desolada com a ausência da filha.

A desolação que perscruta Filipa impinge-lhe o desejo de fuga que pode ser lido como uma ânsia de retorno à liberdade de suas ancestrais, em um mundo em que o desejo era livremente experimentado e um ser não era comercializado. É movida pelo desejo que Filipa rouba uma caixinha de madrepérola onde reúne pequenas relíquias que para ela significam muito. Torna-se companheira de Mb'ta, negro banto escravizado. Quando seu furto é descoberto o casal foge, é perseguido pelo bando de João Tiberetê é brutalmente assassinado na frente de sua filha, Maria, que estava com 05 anos de idade. Chamamos a atenção para a força de Filipa de não se render perante as imposições da vida de escravizada, ela é mulher de seus desejos, de fuga inclusive, por eles dá a própria vida.

Maria, filha de Filipa, além de seus pais, tem a sua identidade arrancada, nasce Maria Mb'ta, no bando de João Tiberetê, onde cresce, torna-se Maria Cafuza: "Mas nunca em sua vida, desde que se tornou Maria Cafuza, ela sorriu." (SILVEIRA, 2018, p. 59). Ela também não fala, seu enunciado do silêncio comunica sua profunda discordância diante da monstruosidade que marcou a sua vida. Maria, aos 14 anos de idade, mata João Tiberetê, que dormia em sua tenda. Assume o bando Manu Taiaôba que, talvez por ter presenciado o assassinato dos pais de Maria têm-lhe um sentimento de proteção, apaixona-se por ela, mas é Maria quem decide quando eles ficam juntos, sempre às noites de lua cheia. Desses encontros geram Maria Taiaôba, a mãe morre de parto, ela muda para o Recife com o pai, para que tenha uma vida diferente da vida de Maria Cafuza, que cresceu em companhia do bando.

Manu Taiaôba assume uma postura diferente do que é atribuído e até esperado socialmente como uma atitude masculina, ele possibilita inclusive que Maria Taiaôba seja a primeira mulher da linhagem a aprender a ler e a escrever. As vidas dessa personagem e de sua filha com o português Duarte Antônio de Oliveira, Belmira, são atravessadas pela invasão dos holandeses ao Recife, que provocou uma guerra com duração de 16 anos.

Lendo a narrativa de Maria Taiaôba situamos esse evento histórico a partir da vida de uma mulher, do seu cotidiano, de suas estratégias adotadas para sobrevivência, mesmo na ampla desolação deixada pelas consequências da guerra: "O coração de Maria era de paz e, no meio de tudo aquilo, doía ao ver tanto sofrimento." (SILVEIRA, 2018, p. 78).

Belmira morre precocemente e deixa Guilhermina, fruto de sua breve união com um soldado holandês, que é criada pela avó. A história de Guilhermina fecha o capítulo, ela é forte, destemida, possuía muita autoridade na lida, "enfeitiçava o gado" com que começou a trabalhar ao lado do marido Bento, que era santeiro. Interessante observar a presença de elementos que promovem uma transgressão na generificação de ações: é Guilhermina quem lida com o gado, inclusive passa a se vestir como homens, cujas roupas são mais apropriadas ao trabalho. Bento é um artista que produz santas de profunda delicadeza, inspiradas na beleza de Guilhermina, aprimorando a técnica quando mudam para Minas e ele passa a esculpir em pedra sabão. Aqui, Maria José Silveira ficcionaliza também os artistas mineiros cuja estética sacra é profundamente marcada e reconhecida.

O capítulo "Esplendor improvável" conta a história de Ana de Pádua, Clara Joaquina, Jacira Antônia, Maria Bárbara e Damiana. A partir deste ponto da obra, percebemos que os papéis sociais se tornam mais definidos, o patriarcado, em sua centralidade fálica, amplia seu poder de dominação, como afirma Durval Muniz de Albuquerque Júnior: "Essa centralidade do pênis, na definição da masculinidade, só tende a se acentuar à medida que surgem as primeiras notícias sobre o sexo e os rigores da separação de conduta entre homens e mulheres pareciam acentuar-se." (ALBUQUERQUE JÚNIOR, 2013, p. 222).

Ana de Pádua, filha de Guilhermina e Bento, é uma das personagens cuja história é narrada com mais detalhes, ela sofre violência doméstica, tem um primeiro marido extremamente ciumento. Ainda casada, Ana, em um ato de transgressão jamais perdoado a uma mulher, envolve-se amorosamente com José Garcia, que mata seu marido violento. O romance dos dois acontece em meio à guerra dos emboabas e dos paulistas. Ana se refugia em São Paulo, onde sofre preconceito para ser aceita pela família de seu companhiro. Por meio de sua história conhecemos a luta construída por mulheres que buscavam legitimar o movimento que mantinham os homens em Minas, lutando pelo domínio do ouro. Interessante registrar que passado todo o período de guerra, Ana se vê enciumada do marido e adota várias

estratégias para evitar suas traições. A personagem passa a centrar as suas ações para evitar as "fornicações" do marido, o que pode ser lido como uma forma de negar a centralidade construída a partir do falo, com o qual o homem se afirma como ser masculino.

Até mesmo a filha de Ana de Pádua, Clara Joaquina, que poderia ser lida como uma anti-heroína da linhagem, aceita uma proposta de casamento e utiliza-se deste exclusivamente para satisfazer o seu desejo de morar no Rio de Janeiro. Torna-se uma pessoa extremamente frustrada, ela se vinga na filha, Jacira Antônia, que é criada como filha adotiva após Clara declarar ao marido que a Jacira é bastarda. Aliás, Clara Joaquina é assassinada exatamente depois de cumprir o seu plano de traição, ferindo, desta forma, a masculinidade de seu companheiro, pois ela sabia onde poderia atingi-lo de forma contundente, sabia que no falo ou na ineficácia deste, residia a centralidade de sua afirmação.

Contrariando essa centralidade está o Capitão Dagoberto, com quem Jacira Antônia se casa. Ele vem da capitania do Ceará e de passagem por Goiás enxerga em Jacira uma grande companheira. É um homem que acusa uma crise de masculinidade, no sentido de que ele não apresenta uma angústia na forma como divide seus projetos com Jacira, mas ao contrário escuta e respeita a sua opinião. É bastante poética a reverberação do passado que encontramos quando Jacira compra de um padre viajante duas imagens de santas de pedra sabão, o que lhe causa uma comoção para ela inexplicável, enquanto o leitor sabe que seu trisavô esculpiu as imagens.

A construção do casal se dá a partir das imagens e enunciados que definem a elite rural sertaneja, eles são empreendedores e o nome do Capitão, mesmo depois de morto, tem força de lei quando evocado por Jacira. O episódio em que Jacira defende a fazenda dos indígenas sem a presença do Capitão e ignorando sua ancestralidade, teve inspiração em uma história real: "Depois desse dia em que descobriu seu poder e se sentiu tão bem, algo em Jacira mudou." (SILVEIRA, 2018, p. 149).

Pensamos que, em Jacira, a desencarnação do falo se dá na construção desse afeto em que eles se tornam um, em um determinado trecho, a autora pergunta: "Vocês estão surpreendidos por uma mulher assumir poder e mando naquela época?" (SILVEIRA, 2018, p. 153). Ocorre desta forma uma desgenerificação do poder, ainda que Jacira continue evocando seu Capitão com o qual ela tornou-se um ser só, ela o faz porque se vê significada, inclusive quando o Dagoberto manda incluir sua inicial no monograma da família, Jacira é valorizada e protagonista de sua própria história.

A filha do casal, Maria Bárbara, tem uma morte precoce e não podemos deixar de anotar a sua força para lutar contra tudo que impede a vivência do seu grande amor, plano interrompido por Jacira, que tinha outros horizontes em vista para a filha. De Maria Bárbara nasce Damiana que tem uma das mais belas histórias narradas. A primeira mulher da linhagem que comunica suas ideias por meio de textos. Ela é bem informada, idealista e acaba tendo a sua sensibilidade de artista aprisionada pela instituição social do casamento. Damiana tem o seu corpo aprisionado em um convento, o marido com grande influência social, pratica esse ato de violência existencial porque Damiana, insatisfeita com o casamento, ousa pedir o divórcio.

Essa história aproxima a obra de Maria José Silveira de uma realidade: embora a escrita feminina seja construída na contramão de um poder falocêntrico que institui o patriarcado e autoriza o poder sobre a corporeidade da mulher, vemos por meio do episódio da morte de Damiana quantas vezes esse poder sai vencedor.

No convento, ela continua escrevendo e atira seus escritos por uma janela sem saber que esta não dá para a rua, mas para um matagal: "É ali que seus escritos vão cair e se perder entre as folhas caídas das árvores, uma folha a mais entre tantas" [...] (SILVEIRA, 2018, p. 180). Esse trecho é muito significativo, pois Damiana morre como mais uma mulher entre tantas, dois dias depois da declaração da Independência do Brasil, cujo ideologia ela carregava e tantas vezes defendeu, apaga-se assim o esplendor realmente improvável anunciado no título.

O capítulo seguinte, "Viciosa modernidade", traz as histórias de mais quatro mulheres. Açucena Brasília, filha de Damiana, que teve a convivência com sua mãe furtada pelo pai, tem já em sua identidade um conflito: esse foi o nome escolhido pela mãe, o pai, português, escolheu Antônia Carlota. Ela é criada pelo tio, irmão gêmeo da mãe de Damiana. Esse personagem, Mariano, também foge ao padrão de masculinidade socialmente imposto, tanto o é que a criação de Açucena é permeada pela liberdade de suas ações. Ela é livre para dançar e para amar, uma personagem descrita como doce, com mãos de cura. Chama a atenção a passagem em que eles incentivam seus escravos a aprenderem uma profissão, presenteando-os com a alforria. Eles residem na divisa de Minas com São Paulo e sua casa se torna um lugar aconchegante para todos da vila. Muitos foram os amores de Açucena, com o mascate Caio ela teve Diana América. Caio morre em uma tocaia armada para seu grupo, ele levava munição para um quilombo na Bahia. Os ideais abolicionistas de Açucena e do tio são muito fortes. Ela teve uma longa vida, conheceu seus netos e bisnetos, viu chegar a República e dançou lundu na Abolição, fatos históricos que atravessam a sua vida.

Como a vida de Açucena se desenrolou sem amarras sociais do que se espera de uma mulher, a educação de Diana América também é construída de forma que a possibilite ser quem ela quiser. Vai estudar no Rio, na casa de parentes, torna-se uma excelente pianista e nessa passagem ficcionaliza-se a Princesa Isabel que percebe a desenvoltura de Diana como musicista. Também é retratada a efervescência cultural do Rio com seus cafés, saraus e encontros de intelectuais. A Guerra do Paraguai é situada no contexto do capítulo, assim como mais um daqueles momentos de reverberação do passado, quando a esposa do tio de Diana lhe dá para que seja levado a sua mãe um porta-jóias de madrepérola muito antigo, que suas filhas acham feio. É aquele mesmo, desejo de Filipa pelo qual perdeu a vida e que já pertenceu a outras mulheres da família ao longo da narrativa. Depois de ter um filho com um estudante inglês, que ela entrega aos cuidados de Açucena, Diana engravida de um revolucionário e nasce Diva Felícia. A personagem, apresentando um quadro de depressão, aceita se casar com Caetano Acioli, um rico negociante bem mais velho do que ela, que assume a criança, em oposição à postura assumida pelo pai biológico que nem toma conhecimento da filha. Diana pertence ao Clube Abolicionista e morre de febre amarela.

Diva Felícia é a primeira mulher da linhagem a frequentar a escola regular, estuda fotografia e passa um tempo se aprimorando na Europa. Em sua história aparecem ficcionalizados Pereira Passos, que contrata seu marido para trabalhar no projeto de urbanização do Rio, e Tarsila do Amaral, que ela conhece em uma viagem de volta da Europa. Vemos ainda retratados o movimento higienista, o massacre de pobres, a desapropriação de casarões no Rio.

Diva tem uma rara sensibilidade para a fotografia desenvolvida desde criança, quando visitava Açucena e retratava a paisagem natural. A sua forte personalidade se sobressai por meio da ousadia que lhe confere a segurança de ser e transparecer por fora a imensa liberdade que ela tem em seu interior. Diva decide pedir o divórcio mas morre antes disso, atropelada por um símbolo da modernidade: o automóvel.

Essa liberdade de Diva é mal percebida por sua filha Ana Eulália, estudante de um colégio interno e com um pensamento formado e inscrito nos códigos do patriarcado, ela se julga muito religiosa e não percebe o quão paradoxal é rezar para que mãe morra e, assim, ela não passe vergonha. Também não vê a hipocrisia de rezar para que o ser amado de sua melhor amiga a abandone. Aliás é com ele, Umberto Rancieri, que ela acaba casando, passando a residir em São Paulo. Ana Eulália o acreditava rico, mas ele vinha de uma família humilde de italianos, seu pai era alfaiate. Alguns fatos históricos atravessam o capítulo: fim da Primeira Guerra, Revolução Soviética, Greve de Operários em São Paulo e no Rio de Janeiro, a formação da Coluna Prestes. Eulália dá à luz Rosa Alfonsina, vive uma angústia muito forte, ancorada em concepções que ela acreditava serem as únicas e verdadeiras, morre depressiva em seu segundo parto, junto com o filho.

"Signo do lucro" é o último capítulo, aproxima-se do nosso tempo presente e inclusive algumas personagens não tiveram seu final escrito. É um momento muito forte do livro que traz à superfície o fantasma da ditadura cívico-militar.

Começa com a história de Rosa que com a morte precoce da mãe teve uma criação permeada de muito amor por parte de seu pai e de avós. Ela se forma como professora, casa-se com um médico e aparece ficcionalizado Juscelino Kubistchek, como um mentor de Túlio Faiad, esposo de Rosa. Quando do mandato de Juscelino, o também médico é convidado para junto com sua família construir o projeto Brasília, em 1955. A relação de Rosa e Túlio é de muito respeito, percebemos a construção de um afeto a partir da admiração mútua em que não cabe a diferenciação do outro por questões de gênero socialmente impostas.

Eles geram Lígia que tem uma história muito tocante. Ela cresce junto com Brasília, é estudante de arquitetura, tem um forte senso de justiça e anseia pela igualdade entre todos, o ano é 1963. Participa de grupos de estudos marxistas e de manifestações que a levam a um engajamento cada vez mais profundo, na militância se aproxima de Chico. É muito simbólico acompanhar a vida deles atravessada pelos acontecimentos do ano de 1968, ano em que Lígia engravida. Sua filha, Maria Flor, nasce no dia da promulgação do AI-5. O casal vai morar no Rio e deixa Maria Flor com Rosa, em Brasília.

O episódio em que Lígia acidentalmente ao pegar um punhado de panfletos para distribuir lança junto, na Avenida Rio Branco, vários papéis com as letras das músicas de protesto que escreve foi inspirado na história real de Maria Lúcia Torres.

Lígia é presa, torturada e assassinada: "É uma entre os quatrocentos e trinta e quatro brasileiros dados oficialmente como mortos e desaparecidos durante a repressão da ditadura militar." (SILVEIRA, 2018, p. 267). Rosa tem a sua vida atravessada pela dor e a repressão causadas e pela dor de perder a sua filha, alcançando o lucro de estar viva e poder criar a neta.

A vida de Maria Flor, assim como a de sua filha Amanda, está situada no presente, envolta em questões éticas e políticas de hoje. Aparecem as Diretas Já, o Impeachment de Collor, a quase vitória de Lula. Amanda, nascida em 2001, vê o conturbado momento de 2013 e está grávida quando do Impeachment de Dilma, que data e fecha a narrativa. Esse último capítulo foi incluído na nova edição do livro, de 2018. Há uma quebra na forma como a narrativa havia sido conduzida até aqui, talvez pela proximidade temporal com os fatos elucidados, talvez por ter se passado quase 20 anos

para a escritora também, o fato é que parece-nos que a intenção dessa era unir as pontas da história, já que Amanda dará à luz sua filha na Bahia, onde Inaiá nasceu.

Em seu romance, Maria José Silveira articula narrativamente os acontecimentos dispersos tramando os fios das vidas dessas mulheres e enredando-os aos acontecimentos históricos. Essas mulheres são projetadas a partir do que as define e também do que as limita, acreditamos, assim, que a autora constrói a partir de uma perspectiva feminina de escrita um texto que desdobra essas identidades no percurso de nossa própria história enquanto nação, promovendo o que Durval Muniz preconiza em obra já citada: "para promover o respeito ao feminino, em todas as variações, é preciso que na carnação da fala se faça a desencarnação do falo." (ALBUQUERQUE JUNIOR, 2013, p. 229).

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Measuring the Level of Achievement of Standards-Based Basic Education STEM Research and its Effect on Students' Quality of Research: A Predictive Modelling as Basis for Improvement

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Abstract- The introduction of the Enhanced Basic Education Act of 2013 has paved the way for the introduction of formal study of research in basic education across senior high school catering schools in the Philippines. Thus, it is imperative to assess how standards related to research in both learning, teaching, and leading standards are achieved by Science, Technology, Engineering, and Mathematics (STEM) providing schools and how these standards affect the quality of research papers produced by the students, and how to improve curricular structure and instruction based on the findings of the study. A total of 123 students, 16 teachers who took and taught research subjects last 2021-2022, and five school heads of two public schools participated in the study. Using four researcher-made instruments with good to excellent reliability results, in which teachers assessed learning standards, student and school heads measured teaching standards and teachers assessed leading standards.

Keywords: learning standards, teaching standards, leading standards, quality of research, science education.

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Abstract of the Study- The introduction of the Enhanced Basic Education Act of 2013 has paved the way for the introduction of formal study of research in basic education across senior high school catering schools in the Philippines. Thus, it is imperative to assess how standards related to research in both learning, teaching, and leading standards are achieved by Science, Technology, Engineering, and Mathematics (STEM) providing schools and how these standards affect the quality of research papers produced by the students, and how to improve curricular structure and instruction based on the findings of the study. A total of 123 students, 16 teachers who took and taught research subjects last 2021-2022, and five school heads of two public schools participated in the study. Using four researcher-made instruments with good to excellent reliability results, in which teachers assessed learning standards, student and school heads measured teaching standards and teachers assessed leading standards. Results showed that the research assessed were found to need improvement in terms of quality, learning standards were achieved at an average beginner level, and teaching and leading standards were found to be on the proficient level. Predictive modeling showed that the quality of the research paper is directly influenced by learning standards, teaching standards domains one, two, and seven, and overall leading standards. In conclusion, schools must improve student, teacher, and school heads' skills and capacity to do research and achieve the standards related to research to increase the quality of research papers produced by the students through the revision of curricular structure, instruction, and development programs for concerned stakeholders.

Keywords: learning standards, teaching standards, leading standards, quality of research, science education.

I. Introduction

a) Context of Research in Basic Education

Only after the legislative foundation for the addition of two more years to extend high school education to prepare for the university level was approved was research in basic education introduced. The aims for college, vocational, and technical job opportunities are expanded by Republic Act No. 10533, also known as the Enhanced Basic Education Act of 2013. Following this law, the Department of Education (DepEd) published Department Order (DO) number 43 (2013), which implements the rules and regulations of the Republic Act No. 10533 and DO No. 21 s. 2019 Policy Guidelines for the K–12 Basic Education Program enable K–12 implementation standardization. These changes to the basic education curriculum correspond with Sustainable Development Goal 4, which aims to deliver quality education. Its guiding concept of offering a curriculum that is inclusive, progressive, appropriate, and pertinent supports SDG 4's objectives (Quick Guide to SDG 4 and its Indicators, 2018). Students are formally introduced to research courses in Senior High School (SHS). In the SHS core curriculum, two particular core courses aim to provide skills that lead to systematic research in the applied course of the SHS tracks, three courses are dedicated to research: Practical Research 1, dealing with qualitative research; Practical Research 2 which trains the student for quantitative research and Inquires, Investigations, and Immersion, on the practical application of research and integrative, scientific and creative academic manner. In the Science Technology, Engineering, and Mathematics (STEM) Strand, the students also have their final research commonly termed a Research capstone. The Enhanced Basic Education Program and curriculum's target skills were established as the learning outcomes for this course, and the DepEd set these applied courses to require students to produce well-written research reports as their product. Accordingly, in translation research productivity, quantity, and quality are the most appropriate measures of basic education institutions if these outcomes are achieved. However, as things stand, there is a dearth of studies and research on basic education research quality, which is followed by standards-based evaluation of the attainment of standards, particularly student-led research (Kuzhabekova & Lee, 2018; Atieno et al., 2021).

b) Learning Standards of Research Courses in Basic Education

Standards can be understood as definitions of what someone should know and be able to do to be considered competent in a (professional or educational) domain. Standards can be used to describe and communicate what is most worthy or desirable to achieve, what counts as quality learning, or as good practice. Standards can also be used as measures or benchmarks, and, thus, as a tool for decision-making, indicating the distance between actual performance and

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the minimum level of performance required to be considered competent. In other words, standards can be understood as defining the dimensions of performance or the domains of learning that are valued and that are worthy of being promoted, but they can also be used to assess if what is valued is being achieved or not. Thus, standards can be used in the sense of a banner or flag and as a yardstick or a measuring rod (Centre of Study for Policies and Practices in Education, 2013). In the Philippine context, the spiral progressive curricular framework of the K to 12 programs is explicitly articulated in its learning standards and learning competencies that are iterated to be research-based (Policy Guidelines on the K to 12 Basic Education Program, 2019, pg. 9). Standards and principles of the curriculum mandates for a learner-centered, inclusive, developmental program that is relevant, responsive, and research-based (Implementing Rules and Regulation of the Republic Act 10533, 2013, pg. 3, Rule II, Section 10.2). Under section VII, Monitoring and Evaluation, the key immediate evaluation of Intermediate outcomes is the attainment of learning standards (Policy Guidelines on the K to 12 Basic Education Program, 2019, pg. 13). Learning standards were divided into two major reiterations, content standards and performance standards, which are detailed in the learning competencies provision of the curriculum. These standards were set as guidance for instruction and ultimately the education goal for each course to attain the ultimate holistic development ready students for higher education (Policy Guidelines on the K to 12 Basic Education Program, 2019, pg. 13). Each plotted course in every strand has a corresponding learning standard. In the STEM curriculum, research subjects were generally plotted with standards that aim for students to develop scientific research knowledge and skills necessary for them to create a scientific report or paper, especially in Research Capstone (Policy Guidelines on the K to 12 Basic Education Program, 2019, Annex 2, pg. 65-66; Clarifications and Additional Information to DepEd Order No. 30, 2018, Enclosure No. 3). The research of White (2021) stipulated that the shift to standards-based grading and assessment should be strengthened in such a way that all teacher's means of verification should be anchored to the intended learning, teaching, and leading standards prescribed by the authorities. Another crucial and contentious component of a genuine standards-based system is behavior grading. To understand how teachers determined students' final marks on report cards, Tierney et al. (2011) conducted a study and stated that they deducted points for unfinished work and concurred that a student's grade was determined by how well they ranked among their peers. Grading standards change depending on teacher experience and school contexts, according to Gershenson's (2020) study of how teacher evaluations affect content knowledge. Students must be taught the skill that is being scored to have correct grading systems; otherwise, grades are fundamentally faulty and no longer a reliable indicator of student competency (Schimmer, 2016). Parents need to know that the marks they see for their students are an accurate depiction of their learning at that time because grades should indicate proficiency rather than reward actions (Schimmer, 2016). Thus, pieces of evidence of learning must be aligned with standards. Further, this implies revisitation of the means of verification guidelines of the department of education in which verifications still include ICT integration/utilizing technology resources in planning, designing, and delivery of the lesson, materials to be used are specified in the LP, and all parts are present. Several research has examined whether standards-based systems' skills link to greater test scores and achievement and have shown the correlation between test scores and standards-based grading systems (Lehman et al., 2018; U.S. Department of Education, 2017).

However, few have been reported to have investigated the actual accomplishment of these learning standards, thus, this study was delved into finding out the attainment of these learning standards by closely examining the students and their research outputs against these prescribed standards.

c) Teaching Standards Related to Research for Basic Education

Teaching standards were described as the demands placed on teachers' professional engagement, practice, and knowledge levels that also give teachers the freedom to apply their developing knowledge in a variety of more sophisticated teaching and learning scenarios (National Adoption and Implementation of Professional Standards for Teachers, 2017, pg. 4).

The DepEd Order (DO) number 43, Implementing Rules and Regulation of the Republic Act 10533 (2013, pg. 3), under rule II, curriculum, explicitly stated that one of the principles of the K to 12 curricula is capable teachers' availability in implementing the guidelines. This means that all learning standards, both content and performance, of the curriculum shall be masterfully possessed by teachers implementing the respective courses, in this case, teachers teaching research courses should be capable of all the knowledge and skills of research, its process, and the writing of the report, to be able to completely implement the curriculum and produce the intended outcomes. Moreover, it has also been stipulated that the implementation of the curricula should be research-based (Policy Guidelines on the K to 12 Basic Education Program, 2019, pg. 4), implying that teachers who implement the respective learning standards prescribed by the national education governing body shall possess the necessary research skills needed. Moreover, it has

also put a premium on pedagogical approaches that hone students' ability to question, investigate, prove, probe, explain, predict, and establish connections among information such as inquiry-based learning, reflective learning, and collaborative learning (Policy Guidelines on the K to 12 Basic Education Program, 2019, pg. 5). All which are covered entirely by the basic education research courses, starting from observation to questioning, to formulating a hypothesis, testing the hypothesis, concluding down to the actual writing of the report and the collaborative nature of how the courses groups student. In support, the DepEd provided a framework that entails training and developing teachers who are qualified to teach the curriculum (National Adoption and Implementation of Professional Standards for Teachers, 2017). It has been stated that through quality teachers the Philippines be able to produce holistic students with 21st-century learning skills that will help the aid development and progress of the Philippines (National Adoption and Implementation of Professional Standards for Teachers, 2017, pg. 3). Implications that teachers must possess the necessary skills to teach the subject aiming for the accomplishment of the learning standards, in context research teachers should have a masterful understanding of the knowledge, increasing student achievement, propelling quality of learning through the quality of teaching.

The Philippine Professional Standards for Teachers (PPST) provides seven distinct domains described according to four career stages, from beginner teacher to distinguished teacher, across the domains there are specific sections that are highly related to the possession of research skills (National Adoption and Implementation of Professional Standards for Teachers, 2017, pg. 4-8). First, Content Knowledge and Pedagogy, in which teachers are trained and expected to use masterful teaching of content knowledge in congruence with skills in applying the set content knowledge to principles of teaching theories and the teaching-learning process. Strand 1.1 of the domain, states that teachers must be able to expertly use content knowledge across the target learning standards and around curricular relations of the entire program, in the context of the research subject teachers must be able to demonstrate excellent usage of content knowledge in the teaching of quantitative and qualitative research and guidance to the student during the writing of the report. Strand 1.2, explicitly includes the research-based knowledge and principles of teaching and learning to be applied by the teachers, implying that any K to 12 teachers must possess the ability to research information and use the research process in the teaching and learning of their respective course, thus, in the context of teachers implementing basic education research courses, must possess masterful skills in researching. Under the domain, strand 1.4, teachers must use strategies that promote literacy and numeracy, across the three main research courses, literacy is developed through qualitative research and numeracy through quantitative research and cumulatively by research capstone, thus, teachers are expected to have the skills in reading, writing, computing, and inferencing, a skill that is fundamentally needed by researchers. Additionally, all the same strands 1.3, use of information and communications technology (ICT), 1.5 state, teachers are expected exemplary skills in using strategies that develop higher-order thinking skills, critical and creative thinking of students, and 1.6 and 1.7 state teacher ability to communicate effectively in the classroom (National Adoption and Implementation of Professional Standards for Teachers, 2017, pg. 10-11). Whether a learner learns anything or not is greatly influenced by the teacher and the following factors. One well-known factor is the teacher's instructional approach and performance effectiveness, which also includes teaching time management, content index, teacher instructional quality, variety of classroom setup, content and cognitive mastery of concepts and skills to be taught, among other important components of successful learning (Yustina et al., 2018; Abu Siri et al., 2020). Knight and Cooper (2019) proved that standards-based grading increases the focus, effectiveness, and enjoyment of teaching and learning, and teachers believe it to be a workable reform.

Consequently, the National Adoption and Implementation of Professional Standards for Teachers (2017) included Domain standard 2, learning environment, which that states to encourage student responsibility and achievement, it is the job of instructors to provide learning environments that are secure, fair, and supportive. This domain focuses on developing learning environments where teachers can effectively control students' conduct both in real-world settings and online. It emphasizes the necessity for educators to use various tools and offers mentally engaging and demanding activities to foster positive classroom interactions directed toward achieving high standards of learning. In the context of basic education research subjects, teachers are demanded to provide learning environments that support the mastery of research and all needed skills and competencies by the students through real-world settings, activities, classroom interaction, and support. According to Ibrahim Abbas (2017), teachers play a significant role in online classrooms as they may create a learning atmosphere and supply instructional materials for students in blended courses. The learning environment is the canvas of teachers' instructional approaches, methods, activities, and theories (Sadera et al., 2014). Fisher (2005) provided several physical measures of an effective learning environment that include the learner and teacher's physical space, availability of learning resources, classroom physical arrangement, and

characteristics, and classroom compatibility to teaching and learning activities, strategies, and methods. Balog (2018) added teaching materials, technical tools, curriculum, training, and instruction.

The inclusion of this requirement in the teaching standards under Domain 3 on learner diversity emphasizes the critical role that teachers play in developing inclusive learning environments. It encourages students to value diversity in the classroom and stresses the importance of using a variety of teaching techniques to prepare all students to be productive members of a local and global community that is always changing. It highlights how important it is for teachers to consider and show respect for their pupils' diverse characteristics and experiences when arranging and developing learning opportunities. The following five requirements must be met for standards to be effective: they must be flexible and developmental (Udvari-Solner, 1996), not one-size-fits-all (Bay, 1997); they must evaluate a range of competencies using guides for creating public policy and engaging learning environments for all students. They allow equitable access to meaningful content (Strong, Silver, & Perini, 1999); they involve the entire school and community in implementing standards (Cook & Friend, 1995); and they allow for a variety of assessment measures rather than high-stakes tests. This implies teaching standards must also cater to the diverse challenges of the students. In the context of teaching research, this includes the ability of teachers to instruct and guide different learning abilities of students to accomplish the necessary learning standards for the research subject. The guidelines also include curriculum and planning under Domain 4 which focuses on the understanding and application of the local and national curricular standards by teachers. This domain covers their capacity to convert curriculum material into engaging learning activities that are founded on the fundamentals of successful teaching and learning. To plan and develop well-structured and sequential classes, either on their own or in conjunction with others, it is expected instructors to use their professional knowledge. These lesson plans and related materials encourage student engagement, knowledge, and achievement, learning programs should be contextually appropriate, responsive to learners' needs, and provide a variety of ways to communicate learning goals. This domain includes standards of planning and management of the teaching and learning process, implying a masterful formulation of teaching, and learning practices for the accomplishment of the intended learning standards and includes alignment of learning outcomes with learning competencies, in the context of research subjects This includes systematic creation of teaching and learning strategies, activities and assessment to accomplish the learning standards.

Additionally, enhanced support for teacher quality training and equipping, with its connective process on Department of Education Order No. 42, series of 2017, the basic education sector adopted the Philippine That allows well-defined domains, strands, and indicators that measure learning, competent practice, and engagement, founded on philosophies of learner-centeredness, lifelong learning, and inclusiveness, thus requiring the teacher to acquire knowledge and skills to effectively deliver quality education. This facet of the guidelines is specific in targeting SDG 4 Quality education, indicator c.1 on teacher training and capacity building (UNESCO Quick Guide to SDG 4 and its indicators, 2018). Factors revealed by research to affect student output and outcomes (Prihantoro et al., 2019; Abu Siri et al., 2020).

The quality of education depends on the quality of teachers; thus, the selection, recruitment, and development of teachers must follow standards to ensure quality teachers that were implemented in the curriculum and help students attain the necessary learning standards (Organization for Economic Cooperation and Development, 2018, p. 20). Results from multilevel modeling demonstrated that fostering conceptual knowledge has a considerable positive impact on students' achievement and situational interest can be characterized by five key factors, according to qualitative analysis. In light of this, integrating Fostering Conceptual Knowledge into biology training appears promising (Förtsch et al., 2020).

d) Leading Standards Related to Research for Basic Education

The quality of education can be explicitly affected by the rules, regulations, and guidelines that govern the school and its human resources, thus, the implementors of these guidelines, the school heads, shall possess the necessary qualifications to shape the school environment (Organization for Economic Cooperation and Development, 2018, p. 20). The Philippine educational system has adopted this particular professional standard for school heads, defined as a set of quality measures that are K–12-aligned, globally comparable, and attentive to school principals' career objectives.

The National Adoption and Implementation of the Philippine Professional Standards for School Heads (PPSSH) (2020), stipulates standards for school heads that include, department heads and school principals or any positions similar. The guidelines recognize the role of school heads in the actual implementation of the intended curriculum and subsequent learning standards and the impact of the attainment of school heads leading standards to the holistic development of teachers and learners. This is in congruence with the Implementation of the Philippine Professional Standards for Supervisors (2019). This particular guideline provided

a framework for the expectations for professional development, effective support for teaching and learning, and leadership skills and proficiency that lead to an efficient and high level of accomplishment of the intended curriculum and standards. PPSSH framework emphasizes that school heads and their leading styles should be learner-centered, build a network of stakeholders for school and people effectiveness, be able to understand and pinpoint problems and issues at the school and address them, formulate high-quality instruction, develop a strong school culture, and work-embedded professional development programs for school personnel presents values and concepts in promoting school success, highlights the function of accountability and transparency, and embeds the principles of inclusivity (National Adoption and Implementation of the Philippine Professional Standards for School Heads, 2020, pg. 4-5). PPSSH framework defines five (5) leading standards or domains, which are (1) Leading Strategically, (2) Managing School Operations and Resources, (3) Focusing on Teaching and Learning, (4) Developing Self and Others, and (5) Building Connections.

School leadership standards in the Philippines were defined in five (5) additional themes; (1) sets the direction of the school, they uses various information and establish patterns for decision-making, this includes the ability to use conduct school wide research and use existing research in formulating plan of action for the whole school; (2) Manages the systems and processes of the school, they ensures the complete implementation of laws, policies, guidelines and regulations relating to all resources of the school contextually this include the managing of the attainment of learning standards for research courses; (3) School leaders promote quality teaching and learning, that encompasses the promotion of necessary 21st century skills that includes the essential characteristics of researchers, this also include the building of learner-centred environment and competence improvement of teachers; (4) Nurture themselves and other through explicit professional development programs and activities this includes attending to seminars and workshop and contextually on research and related-topics; (5) lastly, school leaders engages stakeholders in all school improvement activities this includes building and production of knowledge through research (Philippine Professional Standards for School Heads, 2020). Moreover, the DepEd provided policy guidelines on research management for school heads that insinuates evidence-based decision-making from various education reforms or initiatives shall strengthen the culture of research in the Department headed by school heads in school-based research activities (Research Management Guidelines, 2017). In addition, it improves the fund-sourcing mechanisms and reinforces the link of research to education processes through research dissemination, utilization, and advocacy (Research Management Guidelines, 2017).

Congruently, the Implementing Rules and Regulation of the Republic Act 10533 (2013, pg. 4-6), under Teacher Education and Training, stipulates the principles of Training School Leadership. Superintendents, principals, subject area coordinators, and other instructional school leaders shall likewise undergo workshops and training to enhance their skills in their roles as academic, administrative, and community leaders. DepEd teachers who implement the enhanced basic education curriculum but have not undergone pre-service education aligned with the enhanced basic education curriculum shall be trained to meet the content and performance standards.

e) Standards and Student Outputs

Standards have been defined with the following purposes, for fostering commitments to equity (Barber and Mourshed, 2007), providing common criteria against which to assess students' progress (ACARA 2011, as cited in Organization for Economic Cooperation and Development, 2018, p. 18-19), facilitating communication between the various groups interested in education and its quality, emphasizing the end goal of the school system, and focusing on learning outcomes for students are all ways to make learning expectations for students in schools clear and explicit (Sadler, 1987). Most often standards are created for all areas of learning, going beyond academic achievement and, in some cases, taking social and personal development competencies or the use of technologies into consideration. These standards describe the learning progress along a continuum from beginner to expert for the entire school cycle and in the end the entire education level. Standards have been profoundly stated to direct developmentally appropriate expectations and learning standards, as well as inform instruction that accurately reflects children's ability levels throughout the educational years, to be truly effective in promoting children's development as evidenced by their academic outcomes (Litkowski, 2020), describing general learning paths for particular skills (Clements & Sarama, 2017), concentrates on fundamental concepts that kids have previously understood and promote student academic advancement (Engel et al., 2016) and emphasize aligned of standards across educational years (Stipek et al., 2017). Thus, it provides direct guidance among students, teachers, and school heads on the target learning outcomes and student evidence of learning increasing the quality of outputs.

A study by Leithwood (2008) on school leadership concerning important teacher variables and student performance investigated how much different sources of this leadership contributed on average and whether variations in collective leadership styles were associated with variations in student accomplishment.

the degree to which student achievement varies between schools. All students and other stakeholders received more leadership influence from higher-achieving schools than from lower-achieving schools. The leadership exhibited by school teams, parents, and students was where these distinctions were most noticeable. At all achievement levels, principals received the highest ratings for influence in the classroom implicating that power seems to be a limitless resource. An investigation into how instructional strategies and principals' leadership behaviors in lower secondary schools affect students' achievement and outcomes revealed that teachers have a mediating role in the indirect positive effects that principals' leadership behaviors have on students' math achievement (Özdemir, 2019). To improve the quality of instruction and student accomplishment, principals should acknowledge and support teachers' shared accountability and deprived practices across all educational systems and courses among different student educational levels including basic education. Although standards-based reform is sometimes an underappreciated aspect of instructional leadership (Guskey & Link, 2019), school leaders who are courageous enough to encourage their faculty in this direction are urged to consider several leadership lessons from the literature. This is crucial since principals frequently concur with the principles of altering grading practices but disproportionately report using these principles in their buildings (Carter, 2016). Starting the discussion on grading in schools should follow realistic suggestions. While crucial to teachers and parents, determining the meaning of grades should come after a leadership team has decided on its objectives. To put it another way, schools should carefully analyze the grading reform concepts before tackling policies and procedures (Reeves, 2011).

With all this presented evidence, it is imperative that a thorough investigation into how these standards and the level of achievement of students, teachers, and school heads affect the quality of research papers of STEM students as a measure of culminated research skills.

f) Research Questions

1. What is the level of quality of research capstone of STEM students in their Research Capstone Subject?
2. What is the level of achievement of standards-based research education, in terms of:
   i. Learning Standards as assessed by teachers,
   ii. Teaching Standards as assessed by students and school heads,
   iii. Leading Standards as assessed by teachers?
3. Can the level of standards-based education predict the quality of STEM student research papers?

II. Methodology

a) Research Design

The study employs a descriptive regression design, aiming to create a validated and evaluated instructional material for employing a quantitative predictive modeling design to gather complementary data on the above-mentioned facets of standards-based basic education research to the quality of student research papers (Creswell, Plano Clark, et al., 2003).

b) Sampling, Participants, and Research Locale

The study used purposive stratified random sampling. Selected National Public High Schools of Nueva Ecija catering to the STEM-SHS program was the locale of the study. Participants included Grades 11 & 12 STEM SHS students (n=103) and teachers (n=16) across academic years (AY) 2021-2022 who took and taught practical research 1 & 2 and Research Capstone. Teachers were asked to assess the level of achievement of learning standards and leading standards. The school principals and assistant principals (n=5) were also asked to participate in the evaluation of teaching standards.

c) Data Collection Procedures

The experiment must follow ethical guidelines, and authorization from the administration and school principal must first be obtained. Only students with a parental agreement were involved in the trial. Consent forms from the parents were also secured and incorporated into the computerized forms. A letter to the school heads with all the relevant information was used to get institutional authorization. Following the institution's policy, the steps to retrieve student work from the library shall be followed. For the qualitative portion of the study, a semi-structured interview was created based on the learning-teaching-leading standards set by the DepEd. Google Forms and a shared spreadsheet were used to implement and keep track of surveys, reviews, and evaluations. A review meeting was also done virtually, and it included a discussion of how to implement the evaluation instruments that were used. This study uses various methods to evaluate research productivity. Document and output resources include student research papers, teaching aids, and institutional policies, involving detailed archive examination, organized item lists, and data accuracy checks (Brownson et al., 2009; MacDonald et al., 2001). Direct measurement assesses the quantity and quality of outputs and the research abilities of students and instructors, using a survey to collect qualitative data through essays for statistical analysis and generalizable interpretation. Additionally, semi-structured interviews with key informants gather data on factors affecting study productivity through online recorded sessions.

d) Instrumentation

i. *Instrument 1: Quality of Research Rubric (QRR)*

This study used rubric tools, to measure the independent and dependent variables of the study. The quality of the research paper created in the research capstone of the students was assessed using the rubric used by Santiago and Soliven (2022) among STEM research papers, computed with a reliability of 0.868 alpha score (Hedden, 1997). It is composed of 24 elements that make up the instrument and assesses everything from the feasibility of the study to the conclusion and recommendations. They cover everything from completing key research components through statistics and data analysis to results, interpretation, and debate. It rates the four categories on a Likert scale from Questionable (1) to Excellent to evaluate the article and the researchers' abilities (4). All papers were categorized using a verbal interpretation bracket scheme into four categories: questionable (grades of 1 to 1.49), needs improvement (1.50 to 2.49), competent (2.50 to 3.49), and excellent (grades of 3.5 to 4.0) (Dancey & Reidy, 2002).

ii. *Instrument 2: Research Learning Standards Tool*

To assess the achievement of learning standards the researchers created a questionnaire based on the learning standards of Practical Research 1 & 2 Curriculum Guide (2013) & Research Project/ Capstone Curriculum Guide (2016). It rates the achievement of learning standards using the Likert scale from Not Observed at all (1) to Excellent to evaluate the article and the researchers' abilities (4). It is composed of eleven (11) items. Achievement of learning standards was categorized using a verbal interpretation bracket scheme into four categories: Needs improvement (grades of 1 to 1.49), beginner (1.50 to 2.49), proficient (2.50 to 3.49), and highly proficient (grades of 3.50 to 4.0) (Dancey & Reidy, 2002). This was employed by both the students and teachers to ensure unbiased data from both raters.

iii. *Instrument 3: Research Teaching Standards Tool*

For the measurement of achievement of teaching standards concerning research, the researcher created a rubric based on the Philippine Professional Standards for Teachers (2017), it used the indicators in the guidelines, and it is composed of 37 items placed under seven distinct domains. It was also measured using Not observed at all (1) to Excellent (4) and was interpreted using the verbal interpretation bracket scheme into four categories: beginner (1 to 1.49), proficient (1.50 to 2.49), highly proficient (2.50 to 3.49), and distinguished (3.50 to 4.0) the same career stage description of the PPST. This was given to the principal, assistant principal, and school heads who assessed the research teachers. Cronbach alpha test revealed an internal consistency score of 0.871 which means the test has an excellent consistency that is adequate for individual measurement and diagnosis.

iv. *Instrument 4: Research Leading Standards Tool*

Leading standards were measured using the rubrics created based on the Philippine Professional Standards for School Heads, (2020), it is composed of 35 items based on the indicators of the PPSSH across five distinct domains (Appendix D). It was also measured using Not observed at all (1) to Excellent (4) and was interpreted using the verbal interpretation bracket scheme into four categories: beginner (1 to 1.49), proficient (1.50 to 2.49), highly proficient (2.50 to 3.49), and distinguished (3.50 to 4.0) (Dancey & Reidy, 2002). the same career stage description of the PPSSH. This was given to the research teachers who were assessed by their school heads.

e) Data Treatment

Descriptive statistics was employed to describe the frequency, percentage, standard deviation, and mean of the qualitative and quantitative data. The number and quality of research, the scientific literacy of students and teachers, and performance evaluation were described using these descriptive data. By offering predictive models of the leading, teaching, and learning standards as independent factors to the dependent variable quality of the study paper, all of which were evaluated using SPSS 26.0, stepwise multivariate linear regression analysis was used.

III. Results and Discussion

a) Level of quality of research capstone of STEM students in their Research Capstone Subject

A total of 17 completed papers were recorded and stored in the school's library, the average production of completed papers was 17 papers with composed of an average with six student authors per paper, formed from the usual strategy of grouping students from either student-led formation or teacher-assigned strategy (Wang et al., 2021). Using the quality rubric tool assessed by three research experts revealed a quality score that corresponds to the need improvement description (M=2.79, SD= .366). In this regard, there is a low quality of STEM research papers even with quite a several individuals per group. Amenable with related studies, this result shows student decreased learning and academic productivity during and after the pandemic, proving as well negative impact and room for improvement in the online educational system, which further suggests a widening gap in the educational system and significant challenges for both teachers and learners (Feng et al., 2021; Wang et al., 2021). This is also congruent with the research of Santiago and Soliven (2022) wherein private school STEM Research was scored low in quality by experts, implying an agreement with the rank of the Philippines in

the study conducted among Asian countries based on the bibliometrics for Scopus published journals. The few citations received by the published research are also indicative of the probable low quality of the research, and notable that published papers are mostly created by teachers since it was only recently that HEIs pushed the effort for research and publication among faculty and students (Guido & Orleans, 2020; Atieno et al., 2021).

This also evidences the need for improvement in the system and implementation of the DO 39 s. 2016, adoption of basic research agenda for primary and secondary education of the DepEd and DO 16 s. 2017, Research Management Guidelines. Moreover, this result provides implications in revisiting the curriculum structure, its contents, and implementation among the STEM strand students and suggesting an imperative mandate among policymakers and implementors in elevating the efforts in furthering the culture of research among basic education schools. These concerns with instructional practices should be in line with the precise learning objectives specified in the curriculum, and curricular innovations should be implemented with integrity (MacDonald, et al., 2016; Phillips, et al., 2017). Implementing the curriculum includes many various elements, such as delivering the material via tools and teaching techniques. Instructional techniques must be in line with the curriculum and support each student's unique requirements to implement curricula with fidelity (Causarano, 2015). Additionally, teachers must be ready to implement the curriculum (McNeill et al., 2016).

This also implies that standards related to research are not yet fully achieved, allowing equity commitments resulting in a more robust student output in this case research paper (Barber & Mourshed, 2007). This also evidences that the uniform criteria for evaluating students' progress needs further improvement in achievement, it has been stated that standards have been profoundly stated to direct developmentally appropriate expectations and learning standards, as well as inform instruction that accurately reflects children's ability levels throughout the educational years (Litkowski, 2020), describing general learning paths for particular skills (Clements & Sarama, 2017), and focuses on fundamental concepts that learners need to understand.

b) Level of Achievement of Standards-Based Research Education

i. *Learning Standards as Assessed by Teachers*

On average, the 123 assessed students by 16 teachers, were found to be beginners (M=2.37, SD= 3.92) across the basic education research learning standards based on the curriculum guide provided by the Department of Education (Clarifications and Additional Information to DepEd Order No. 30, 2018, Enclosure No. 3) (Table 1).

Table 1: Descriptive Statistics of Learning Standards of Two Public Schools for Grade 11 And Grade 12 STEM Students As Assessed By Teachers.

Domains of Learning Standards	Mean	SD	Verbal Description
Domain 1 (Identifying Scientific Problem)	2.65	0.548	Proficient
Domain 2 (Differentiating Research Problem)	1.96	0.615	Beginner
Domain 3 (Selecting Relevant and Related Studies)	2.57	0.605	Proficient
Domain 4 (Reviewing, Digesting, and Concisely Stating the Studies Cited)	2.61	0.588	Proficient
Domain 5 (Hypothesizing)	2.57	0.548	Proficient
Domain 6 (Planning the Experimentation)	2.61	0.588	Proficient
Domain 7 (Selecting Data Collection Procedure)	2.12	0.808	Beginner
Domain 8 (Analyzing Data Obtained)	2.12	0.826	Beginner
Domain 9 (Interpreting and Discussing the Results)	2.16	0.791	Beginner
Domain 10 (Drawing Conclusion)	2.51	0.579	Proficient
Domain 11 (Making Recommendations)	2.22	0.754	Beginner
Total Average	2.37	0.392	Beginner

Legends: Needs improvement (grades of 1 to 1.49), Beginner (1.50 to 2.49), Proficient (2.50 to 3.49), and Highly proficient (grades of 3.50 to 4.0)

This means that students were at least able to get the basics of the 11 learning standards for quantitative and qualitative research, including processes, concepts, and skills. Six out of 11 domains of learning standards were found to be proficient. Students were most proficient at domain one, deciding on the suitable research in a specified area of interest, (M=2.65, SD= 0.548), this makes sense as this domain is taught at the very first lesson and is particularly given the effort by teachers while least scored in domain

seven, gathering and analyzing data with appropriate techniques, (M=2.12, SD=0.808) and eight, concluding, (M=2.12, SD=0.826) (Table 1). This least mastered domain is taught at the very end of the lessons, moreover, teachers who do not specialize in data analysis procedures and treatment have a hard time teaching the domain. This includes skills to utilize appropriate tools to gather data, present and interpret data in tabular and graphical forms, analyze data using statistical methods, with the examination of differences and associations being limited to bivariate analysis, and make conclusions from research findings.

ii. *Teaching Standards as Assessed by Students and School Heads*

In general, the 16 teachers assessed by 123 students, were proficient (M=2.32, SD 0.392) across the research-related teacher standards based on the PPST provided by the Department of Education (National Adoption and Implementation of Professional Standards for Teachers, 2017, pg. 4-8) (Table 2).

Table 2: Descriptive Statistics of Teaching Standards of Two Public Schools for Research Teachers as Assessed by Students and School Heads.

Domains of Teaching Standards	Mean	SD	Verbal Description
Domain 1 (Content Knowledge and Pedagogy)	2.51	0.402	Highly Proficient
Domain 2 (Learning Environment)	2.26	0.486	Proficient
Domain 3 (Diversity of Learners)	2.41	0.462	Proficient
Domain 4 (Curriculum and Planning)	2.23	0.375	Proficient
Domain 5 (Assessment and Reporting)	2.23	0.379	Proficient
Domain 6 (Community Linkages and Professional Engagement)	2.31	0.457	Proficient
Domain 7 (Personal Growth and Professional Development)	2.27	0.539	Proficient
Total Average	2.32	0.392	Proficient

Legend: Beginner (1 to 1.49), Proficient (1.50 to 2.49), Highly Proficient (2.50 to 3.49), and Distinguished (3.50 to 4.0).

This means that teachers were at least masterful in teaching standards related to quantitative and qualitative research. 6 out of 7 domains of teaching standards were found to be proficient and only one is rated highly proficient. Teachers scored highest at domain one, content and pedagogy, (M=2.51, SD= 0.402) while least scored in domain four, curriculum and planning, (M=2.23, SD=0.375) and five, assessment and reporting, (M=2.23, SD=0.379) (Table 2). This means teaching standards related to research were perceived by the students and the school heads to have been at least proficiently achieved by the teachers. The wide array of intended standards such as content knowledge of principles and concepts of research and its implementation, evaluation, and reporting is highly achieved by the teachers, this also includes research-based knowledge practice for teaching and learning, usage of ICT tools in teaching research, promotion of literacy of research writing and numeracy for data analysis and classroom communication strategies. This provides proof of adequate achievement of teaching standards across all the applied and specialized basic education research.

The findings of this study are supported by Kelcey et al. (2019) on the role of instructional quality as a mediating factor for students' learning gains, which includes student-acquired skills and cognitive competency. This implies that the quality of instruction offered by the instructor, which in turn is influenced by the teacher's capacity to produce, manage, and process scientific knowledge, mediates students' ability to develop, manage, and process scientific information necessary for excellent research papers.

iii. *Leading Standards as Assessed by Teachers*

In general, the six school heads assessed by 16 teachers, were proficient (M=2.33, SD 0.386) across the research-related leading standards based on the PPSSH provided by the Department of Education (National Adoption and Implementation of the Philippine Professional Standards for School Heads, 2020) (Table 3).

Table 3: Descriptive Statistics of Leading Standards of Two Public Schools for School Head Assessed by Teachers.

Domains of Leading Standards	Mean	SD	Verbal Description
Domain 1 (Leading Strategically)	2.46	0.374	Proficient
Domain 2 (Managing School Operations and Resources)	2.31	0.366	Proficient
Domain 3 (Focusing on Teaching and Learning)	2.38	0.499	Proficient
Domain 4 (Developing Self and Others)	2.20	0.380	Proficient
Domain 5 (Building Connections)	2.32	0.480	Proficient
Total Average	2.33	0.386	Proficient

Legend: Beginner (1 to 1.49), Proficient (1.50 to 2.49), Highly Proficient (2.50 To 3.49), and Distinguished (3.50 to 4.0).

This means that teachers were at least masterful in teaching standards related to quantitative and qualitative research. All the five domains of leading standards were found to be proficient; school heads scored highest at domain one, leading strategically, (M=2.374, SD= 0.374), this implies while least scored in domain four, developing self and others (M=2.20, SD=0.380) and two, Managing school operations and resources (M=2.31, SD=0.366) (Table 3). School heads' capacity to manage the school strategically in terms of its operations, material, and human resources, development programs, and connections are necessary to run a school and achieve its goal of developing holistic and globally competitive learners through the basic education program. Thus, the Department of Education must monitor and evaluate the achievement of leading standards among schools and the existing school heads.

c) *Predictive Modeling using the Level of Standards-Based Education to the Quality of STEM Student Research*

To determine the predictive pattern of the standards-based domain to the quality of the research paper multiple linear stepwise regression analysis was done. Results reported five models, with model five, being with the highest predictive capacity at 94.7% (Table 4), a value predictive power above the standard set at 60% (Moksony, 1999), and significant ANOVA due to regression result, $F(1,96)=346.07$, $p<.0001$. The model includes the following predictive factors, the overall achievement of leading standards, learning standards, and teaching standards in domains one, two, and seven (Table 5). All variables can be seen in positive correlation with the quality of the research paper, implying that the more learners, teachers, and school heads increase their achievement of standards related to research the more the quality of paper of STEM student research increases in quality, this implies that as students increase in their capacity to perform the content and performance standards of research such as deciding on a suitable design, formulating clear research questions, selecting and synthesizing related pieces of literature and studies, creating a conceptual framework, selecting and creating appropriate methods and resources, able to collect, process and analyze data and coming up with conclusions, the quality of their paper output increase, thus further implying that the quality of research paper is a reflection of overall students learning. Moreover, this established predictive relationship between these variables correlates with the impact of teaching based on set learning standards allowing the expression of students' high learning achievement. It has been described that factors such as skills and academic characteristics a predictive factors for research productivity, as an individual increases with scientific skills the research productivity elevates (Sulo et al., 2012; Atieno et al., 2021). This claim is also supported by the result of Santiago and Soliven (2021) that the quality of research papers is significantly predicted by student research skills, which are aimed to be developed by the learning standards. This suggests that it is imperative to train students in scientific research skills as it affects student research productivity, much more in the context of basic education, when it has only been formally introduced in the year 2013 (Enhance Basic Education Curriculum, 2013). This also provides inputs for augmenting instruction and curriculum for more qualified and quantified research outputs as student skill reflection.

Agreeable to this result is the predictive relationship of teaching standards domains one, two, and seven to the quality of the research paper. Domain one includes teachers' content knowledge and performance ability for research, congruent with the overall learning standards, it also includes teachers' research-based knowledge and teaching and learning teaching and subsequent factors have a huge impact on learning that includes content and cognitive mastery of skills, such as the scientific method and research skills, for successful learning (Prihantoro et al., 2019; Abu Siri et al., 2020). It also implies that teachers' overall skills in using ICT, such as using computer software in organizing data collected and using research statistical software in analyzing data affect positively student research papers, moreover, this also implies that as teachers' skills in promoting literacy, numeracy and higher order thinking skills their research paper increases in quality, teachers ability to train students in writing the research report based on standards of formal research writing while training them in analyzing data and interpreting it are part of this literacy, numeracy and higher order thinking skills promotion (Edelson et al., 2021). Lastly, this domain includes teachers' skills in a communication strategy that includes the ability of the teacher to provide effective feedback for student knowledge construction, and the ability to provide constructive comments to increase the quality of the paper. teacher's role in changing classroom practices should be revisited to change subsequent outcomes (Edelson et al., 2021).

It may not come as a surprise the overall achievement of learning standards set by education authorities significantly predicts the quality of student research outputs. However, it is enlightening that not just teaching and learning standards related to research affect the quality of student research output but also leading standards. As seen leading standards include strategic leadership skills related to research such as formulation, implementation of the school's vision, mission, and core values related to research, planning, and implementation that includes policy review, notably it explicitly mandates strategic leading through research and innovation that includes monitoring and evaluation

of process and tools, this means that school head's ability to lead that utilizes concepts and principles of research affects the quality of student works. This can be further observed with the school head's ability to design and implement research programs for both students and teachers. Moreover, the total leading standards include managing school operations and resources, such as records management that is essential for data gathering for research, moreover, management of school facilities and equipment is also included such as libraries that store student research works for future reference technological devices that students and teacher can use for research. This also includes openness to opportunities and challenges that can be addressed to make research easier and more manageable.

Table 4: Stepwise Regression Modelling of the Standards-Based Domains to Quality of STEM Student Research.

Model Summary								
Model	R	R^2	Adjusted R Square	Std. Error	df1	df2	Sig.	Durbin-Watson
5	.973	0.947	0.945	0.08877	1	96	0.039	0.687

Predictors: (Constant), Learning Standards, Teaching Standards 1, 2, 7 and Total Leading Standards.
Dependent Variable: Quality of Research Paper

Additionally, leading standards include school leaders' skills in reviewing school-based contextual-lization and implementation of learning standards that include basic education research subjects while utilizing the achievement of teaching standards and pedagogies associated with it augmented with teacher and learner's feedback to school teaching and learning system. This also includes management of learning assessment and evaluation processes and results, innovation in the learning environment, and discipline. All of these are directly evidenced to affect student learning and performance, as such it is safe to conclude based on the result of the study that as the school head achieves proficiency to these leading standards student research also increases in quality. However, it is notable that the last domains include developing a leader's self and others and building connections is also included in this total leading standard. This implies that school leader's personal and professional development related to research affects how leaders manage learners and teachers in terms of the engagement and development for research, this also includes rewards and recognition systems for the school leaders, teachers, and learners. Additionally, it also provides conclusive evidence that school heads' relations and management of internal and external organizations and partners affect student quality of research. With external and internal personal and professional development for research, school heads increase their capacity in planning, implementing, and evaluating research endeavors, and in turn affects teachers' and learner's skills in research through careful planning of programs for the development of research skills.

Table 5: Stepwise Regression Coefficient Table

Variables	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	0.526	0.085		6.152	0
Total Leading Standards	0.221	0.083	0.226	2.666	0.009
Total Learning Standards	0.255	0.086	0.215	2.98	0.004
Teaching Standards Domain 1	0.255	0.066	0.272	3.889	0
Teaching Standards Domain 2	0.128	0.058	0.165	2.204	0.03
Teaching Standards Domain 7	0.092	0.044	0.131	2.096	0.039

Table 5, provides a modeling formula:

$$y = .526 + .221*X^1 + .255*X^2 + .255*X^3 + .128*X^4 + 0.092*X^5$$

Whereas y is the quality of STEM student research, X^1 is the score of overall learning standards, X^2 is the score of the overall achievement of learning standards, X^3 is the score of teaching standards under domain 1, while X^4 is domain 2 and X^5 is Domain 7.

IV. Conclusions

Schools must have adequate if not high, research productivity. After all, it is one of the best indicators of a student's knowledge and skills because it captures all of their thinking abilities according to Bloom's taxonomy. Additionally, it shows how well the school has done in comparison to other institutions of higher learning. With the findings, the study concludes that STEM senior high schools have relatively poor research about beginner achievement levels on learning standards for research, teachers were found to achieve the teaching standards for research at a proficient level together with a proficient achievement level of leading standards. The predictive model concludes a direct relationship between student quality of research output with learning standards, overall leading standards, and teaching standards domains one, two, and seven.

V. Recommendations

The result of that directly implies the relationship between the level of learning standards, leading standards, and teaching standards in domains one, two, and seven, it is recommended that schools offering STEM courses achieve a high level of accomplishment of these standards. Provide students with learning opportunities that are anchored firmly to the learning standards in both content and performance standards. Schools and government authorities should also focus on the achievement of the high level of leading standards among school heads, provision of professional development opportunities across areas of strategic leading, management of school operations and resources, and skills in the management, measurement, and innovation of teaching and learning, developing self and others, and building connections about research can increase the quality of research paper produced by students. Lastly, achieving a high level of teaching standards in areas of content and pedagogy of teachers for research needs to be further developed, and provision of training for teachers in the area of research and the different teaching strategies and learning activities for teaching research should be firmly implemented and consistently done, moreover, provision of the conducive learning environment in the teaching and learning of research should also be a focus, such as the provision of access to national and international research papers, classroom structures that allow easy access to research instruments that allow a higher percentage of student participation, and lastly, schools must also focus in providing teachers in furthering themselves for personal and professional growth that impacts their philosophy, increased professional links and improvement of practice for better teaching of research subject in the basic education sector.

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The Effects of Public Education Spending on the Efficacy of Human Capital Training in Cameroon

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Abstract- This study focuses on the effects of government expenditure on human capital training in the Cameroon education system. The work is based on the experience of secondary education system and accesses the efficacy based on the school dropout rate. The descriptive and econometric statistics used on this topic come from the Public Expenditure Tracking Survey carried out in 2019 by the INS. The results of the findings enabled us to conclude that government expenditure, as far as education is concerned, is very helpful in human capital training because it reduces the rate of school dropout in Cameroon. In other words, government spending helps to reduce school disparities in rural and urban areas, improves the quality of educational infrastructure and the living standards of teachers.

Keywords: *public expenditure, human capital, educational system, school dropout.*

GJHSS-G Classification: *LCC: LC89.C3, LC92.C3*

Strictly as per the compliance and regulations of:

The Effects of Public Education Spending on the Efficacy of Human Capital Training in Cameroon

Effets des Dépenses Publiques D'éducation Sur L'efficacité Dans la Formation du Capital Humain au Cameroun

Mowitougou Bertrand Ulrich

Résumé- **Cet article met en exergue la contribution des dépenses publiques à l'efficacité dans la formation du capital humain au Cameroun, à la lumière de son système éducatif. Pour ce faire, il se fonde sur l'expérience de l'enseignement secondaire et apprécie l'efficacité à partir du taux de déperdition scolaire. Les statistiques descriptives et les estimations économétriques utilisées à ce sujet, relèvent de l'enquête sur le suivi de la traçabilité des dépenses publiques réalisée par l'INS en 2019. Ces éléments de mesure aboutissent aux résultats selon lesquels, les dotations publiques éducatives soutiennent efficacement la formation du capital humain par la réduction des taux de déperdition scolaire. En ce sens, elles permettent, entre autres, d'éliminer les disparités en milieu urbain et rural, d'améliorer l'offre infrastructurelle d'éducation ainsi que les conditions de travail des enseignants.**

Motsclés: dépenses publiques, capital humain, système éducatif, déperdition scolaire.

Abstract- **This study focuses on the effects of government expenditure on human capital training in the Cameroon education system. The work is based on the experience of secondary education system and accesses the efficacy based on the school dropout rate. The descriptive and econometric statistics used on this topic come from the Public Expenditure Tracking Survey carried out in 2019 by the INS. The results of the findings enabled us to conclude that government expenditure, as far as education is concerned, is very helpful in human capital training because it reduces the rate of school dropout in Cameroon. In other words, government spending helps to reduce school disparities in rural and urban areas, improves the quality of educational infrastructure and the living standards of teachers.**

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I. Introduction

Perçue depuis les travaux de Schultz (1962) et Becker (1964) comme l'ensemble des connaissances aux effets cumulatifs, l'éducation, composante majeure du capital humain, est devenue l'un des principaux leviers du développement. Pour cette raison, les gouvernements de toute obédience politique et idéologique, font de l'acquisition des savoirs savants et opérants, le pilier des objectifs de production (Bashir et al, 2018 ; OCDE, 1998). Ce choix fondamental leur permet de construire les interactions entre les individus et les institutions d'une part, et de rentabiliser les potentialités individuelles et collectives d'autre part. Dès lors, il se crée une dynamique qui alimente les débats autour de l'impact des dépenses publiques d'éducation sur le relèvement du capital humain.

S'inscrivant dans cette dynamique, le Cameroun déploie de considérables ressources afin de maîtriser les contours d'un développement humain endogène. En effet, des efforts notables entrepris dans le domaine de l'éducation ont permis notamment d'atteindre une quasi-égalité des performances pour les garçons et les filles. Le taux d'alphabétisation chez les jeunes de 15-24 ans, tout sexe confondu, est ainsi monté à 83,1% tandis que le taux net ajusté de scolarisation (6-11 ans) a évolué de 77% en 2001 à 85% en 2014. Dans la mouvance de cette tendance méliorative, les filles se situent à un point seulement en-dessous des garçons. Par ailleurs, dans l'ordre de l'enseignement secondaire, 1 407 432 élèves étaient inscrits dans les établissements publics en 2016/2017 avec 1 120 064 élèves pour le secondaire général et 287 368 pour le secondaire technique. Même si les trois régions du septentrion enregistrent les plus faibles scores en matière de représentativité des filles au secondaire (30% de filles pour le Nord, 31% pour l'Extrême-Nord et 35 % pour l'Adamaoua), celles-ci occupent une proportion non négligeable et en nette progression de 44% (PETS 3, 2019). Par ailleurs, les données des annuaires statistiques du MINESEC pour les années scolaires 2020/2021 et 2021/2022 révèlent que cette représentativité s'est accrue de l'ordre de 46%. A l'évidence, la tendance haussière observée marque un tournant dans la transformation du tissu éducatif national. En la circonstance, l'Etat ne ménage aucun effort pour soutenir l'école, tout cycle confondu. Au travers d'une allocation des enveloppes budgétaires en expansion d'année en année, cette constance traduit une politique gouvernementale axée sur :

- le développement des infrastructures et des équipements ;
- l'amélioration, dans une certaine proportion, de la qualité de l'éducation et de la vie en milieu scolaire ;

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- l'intensification de la professionnalisation et le recours à de curricula de formation en adéquation avec l'univers économique ambiant ;
- la création de nouvelles institutions scolaires en fonction de la croissance démographique et des ressources financières disponibles.

S'agissant de ce dernier point, il faut relever que la croissance du nombre d'établissements est notoire dans le secondaire comme dans les autres ordres d'enseignement depuis 2015 (SND, 2020).

Cependant, au plan théorique, les économistes sont loin de s'accorder sur les enjeux de la mobilisation des fonds publics en faveur du capital humain. Les controverses portent essentiellement sur le cadre conceptuel qui détermine les liens entre les dépenses publiques d'éducation et le développement des capacités cognitives. De ce fait, alors que les théoriciens keynésiens estiment que l'Etat doit activer les politiques publiques afin de renforcer les équilibres macro-économiques (Samuelson, 1948 ; Hicks, 1937), les auteurs néoclassiques pensent, de leur côté, que les choix publics créent des effets d'éviction au détriment des entrepreneurs (Buchanan et Musgrave, 1999). Cette controverse suscite des questionnements sur l'opportunité des investissements publics, dans des secteurs aussi sensibles que celui de l'éducation. Dans ce cadre, l'option des formules intégratives à valeur utilitaire pour le capital humain est préconisée.

Sur ce plan, de nombreuses études établissent que, lorsque les gouvernements consacrent les bénéfices de la croissance économique au financement de l'éducation pour tous, il en résulte l'amélioration de la productivité du travail et l'augmentation de l'offre de main d'œuvre (Leiderer et Wolff, 2017). Toutefois, ces résultats empiriques sont nuancés par une classe d'auteurs qui jugent ces apports insuffisants (Edeme et al, 2017). Tirant une leçon de cette réserve, le courant équilibriste conclut que l'efficacité des dépenses publiques dépend des conditions éthiques qui entourent leur mise en œuvre (FMI, 2018 ; Banque Mondiale, 2017 ; Kaboré Konkobo, 2008).

Dès lors, mesurer en profondeur les effets des dépenses publiques sur l'efficacité dans la formation du capital humain s'avère indispensable. Cette préoccupation est fondamentale car, en Afrique et au Cameroun, les politiques publiques n'obéissent pas toujours aux agendas nationaux (Noumba, 2008). Ainsi, pour juger de l'importance des dépenses publiques d'éducation, il y a lieu de revenir à la question centrale de l'étude : quels sont les effets des dépenses publiques d'éducation sur l'efficacité dans la formation du capital humain au Cameroun ? Cette interrogation induit l'hypothèse selon laquelle, les dépenses publiques d'éducation améliorent l'efficacité dans la formation du capital humain à travers la réduction du taux de déperdition scolaire. Pour rapprocher cette conjecture de la question qui l'inspire, le travail s'articule autour de la revue de littérature, de la méthodologie et de la présentation des résultats.

II. Revue de Littérature

L'extraction de la littérature va s'opérer en deux étapes : la présentation du cadre théorique relatif au financement public de l'éducation et l'analyse du cadre empirique y afférent.

a) Cadre Théorique du Financement Public De L'éducation

Dans la littérature économique dominante, l'éducation est présentée comme l'un des facteurs pionniers d'accroissement de la productivité et donc, du progrès économique et social. Cette dimension est largement acceptée de nos jours, au point de faire du niveau d'éducation, un instrument de mesure du stade de développement d'un pays (Siakeu, 2000). C'est ainsi que la fréquentation scolaire et l'échelon académique sont corrélés avec les niveaux de revenu.

La littérature indique également l'effet produit par l'éducation tertiaire à connotation universitaire sur le développement économique et humain au plan national ou régional. Sous ce prisme, Lendel (2010), Valero et Van Reenen (2019) relèvent que les universités de recherche aux États-Unis ont, par leur seule présence, un impact positif sur l'emploi et la croissance de la zone métropolitaine correspondante. En effet, une augmentation du nombre d'universités dans la région y propulse le bien-être, en raison des externalités de la connaissance[1] (Agasisti et Bertoletti, 2020 ; Faggian et al, 2019).

Compte tenu de ce qui précède, il devient impératif pour tout Etat de soutenir les principes d'équité et d'égalité au sein de la population (Agboola et Adeyemi, 2012). Une telle implication renforce les arguments en faveur des dépenses publiques d'éducation. Cependant, l'efficacité et l'efficience de l'allocation des ressources publiques suscitent un débat considérable, tant du point de vue idéologique que technique.

Sur le plan idéologique, l'efficacité de l'éducation est confrontée aux indicateurs de mesure dont la plupart sont épurés dans des contextes occidentaux avant d'être transposés dans les pays en développement. Cette transférabilité non contextualisée,

[1] Bien que Becker et Lucas présentent l'éducation et la formation professionnelle comme le résultat des stratégies individuelles, il n'en demeure pas moins qu'elles relèvent également d'une stratégie de la collectivité. En réalité, l'accumulation du capital humain induit des conséquences externes par effet réseau, dans la mesure où le niveau d'éducation d'un individu joue aussi bien sur sa propre productivité que sur celle des personnes avec lesquelles il interagit. Dans ce schéma, la productivité sociale de la formation est supérieure à sa productivité privée, ce qui permet de justifier les dépenses publiques destinées à financer le développement du capital humain.

au demeurant, induit des résultats en-deçà des attentes des populations (Kaboré Konkobo, 2008).

Du point de vue technique, il se pose un problème de niveau d'infrastructures, de moyens mobilisés pour favoriser un aspect ou un autre. Il s'agit d'une question qui fait intervenir les capacités de gestion des ressources dans le sens de l'égalité et de l'équité. A l'évidence, les notions d'égalité et d'équité renvoient à différentes conceptions de nature libérale ou rawlsienne[2] (FMI, 2018). Toutefois, le courant égalitariste de l'équité est privilégié car, il appréhende l'éducation comme un droit fondamental. En ce sens, le niveau et l'efficacité de l'éducation financée par l'Etat peuvent atteindre, s'ils sont soutenus, des standards appréciables. La présentation du cadre empirique du financement public de l'éducation au Cameroun semble ainsi indispensable.

b) Cadre Empirique du Financement Public de L'éducation Secondaire au Cameroun

L'étude sur l'efficacité de la formation du capital humain établit une intrication positive entre la part des ressources consacrée au fonctionnement du système éducatif et les résultats obtenus par tout Etat en la matière (Noumba, 2008). C'est dans ce contexte qu'il a été relevé une constante évolution des budgets alloués aux départements ministériels en charge des questions éducatives au Cameroun (SND, 2020).

En ce qui concerne principalement le Ministère des Enseignements Secondaires (MINESEC), l'enveloppe budgétaire qui lui est allouée n'a cessé de croitre entre 2013 et 2017. La consultation des lois de Finances sur cette période de référence révèle que la part du budget consacrée à ce département ministériel est passée de 220 163 milliards de FCFA en 2013 à 318 997 milliards de FCFA en 2017, soit une hausse de 44% en cinq ans. Des mouvements similaires apparaissent de 2019 à 2022. Cette progression est supérieure à celle du budget global de l'Etat qui se situe à 34% sur la période d'observation. Les principales lignes de dépense retenues sont l'achat des fournitures et le petit entretien de bureau, l'achat de fournitures techniques spécifiques à la fonction et les frais exigibles. Quant aux investissements, ils se résument à la réhabilitation et à la construction des infrastructures éducatives ainsi que des commodités connexes (infirmeries, champs scolaires, coopératives scolaires, salles multimédia, aires de jeux, latrines, …).

Enfin, comme dans la plupart des pays à faible revenu, le financement du secteur éducatif au Cameroun repose, en partie, sur les fonds d'aide publique au développement. A titre d'illustration, ces derniers ont représenté un flux net de 663,6 millions de dollars en 2015, contre 856,2 millions de dollars un an plus tôt. En valeur relative, ils correspondent respectivement à 2,3 % et 2,7 % du produit intérieur brut (PIB) du pays. C'est une réalité trivialement compréhensible dans la mesure où, 14% de l'enveloppe globale d'aide publique au développement est orientée vers l'éducation[3].

Ces importantes enveloppes budgétaires visent, entre autres, à conjurer les risques de déperdition et de décrochage scolaires qui plombent l'efficacité interne du système éducatif ainsi que les initiatives randomisées[4] de développement. Comme le souligne Siakeu (2000), toute politique en faveur de la réduction des taux de déperdition est une perspective de consolidation du capital humain et de projection des équilibres sur le marché du travail.

Toutefois, s'il existe une abondante littérature traitant du financement public du capital humain, la plupart des écrits s'intéressent à la réduction de la pauvreté. En effet, la documentation explorée n'indique pas comment les dépenses publiques peuvent agir avec efficacité, sur les indicateurs de formation du capital humain, à l'instar du taux de déperdition scolaire. Cela étant, la brève littérature proposée montre que l'éducation, partie intrinsèque du capital humain, est un investissement aux externalités positives attendues. A ce titre, l'effet des dépenses publiques sur l'efficacité de la formation du capital humain éducatif s'analyse au niveau de la fréquentation quotidienne des élèves et au niveau de l'augmentation de la scolarisation. Les deux niveaux révèlent que l'impact des politiques d'éducation dépend de la manière avec laquelle celles-ci augmentent les possibilités de durabilité d'un enfant dans un cycle scolaire. Il en résulte un cadre théorique standard spécifié par la relation fonctionnelle suivante :

$$A = f\,(S, Q, C, H, I) \qquad (1)$$

A représente les compétences acquises ou tout autre proxy de l'éducation, S le nombre d'années de scolarité et Q le vecteur des caractéristiques de l'école et de l'enseignant (qualité et efficacité). C s'affiche comme vecteur des caractéristiques de l'enfant (y

[2] John RAWLS est un philosophe américain auteur de la théorie de la justice distributive publiée en 1971 puis rééditée en 1975 et 1999. Dans cette théorie, RAWLS cherche à réconcilier deux principes qui s'opposent souvent, mais qui sont au cœur de l'idéal démocratique : la liberté et l'égalité. Il traite ainsi de la sphère d'action de l'individu et de son autodétermination d'une part ; et de l'égalisation d'un certain type de ressources indispensables pour garantir la liberté des individus d'autre part.

[3] L'ensemble de ces informations proviennent de la Banque de données de l'OCDE année 2015/2016, Comité d'aide au développement.

[4] Les initiatives randomisées du développement désignent toutes les formules englobantes dans lesquelles les agents économiques jouent un rôle essentiel. Dès lors, la structure tutélaire (Etat ou collectivité centrale) n'a plus le monopole de la motivation des engagements et des innovations. Tout le monde participe dans un mouvement impulsé du haut comme du bas, dans une formule « bottom to bottom » (bout en bout).

compris les aptitudes innées). H est un vecteur des caractéristiques d'un agent économique (ici le ménage ou l'Etat) et I un vecteur des intrants scolaires sous le contrôle des ménages (présence quotidienne des enfants, effort à l'école, achats de fournitures scolaires). Dans ce contexte, les indicateurs de l'efficacité, variable essentielle de l'étude, se présentent comme suit :

- le programme scolaire (plaquettes de formation, cursus) ;
- le matériel d'apprentissage (documents, matériel didactique, infrastructures) ;
- le temps d'instruction (horaire, délai, planification) ;
- l'enseignement en classe (pédagogie, enseignants, apprenants) ;
- la capacité d'apprentissage des élèves (admission, redoublement, déperdition).

Tous ces indicateurs ne sont pas évoqués dans l'étude au même niveau, car la référence analytique porte prioritairement sur les déperditions. La méthodologie qui résulte de ce recueil théorique tient compte de l'espace national comme zone d'expression d'investigation

III. Méthodologie

La démarche méthodologique procède de l'exploitation des données secondaires et de la présentation du modèle d'analyse utilisé pour atteindre certains résultats.

a) Les données

Les données proviennent du volet éducation de l'enquête sur la Traçabilité des Dépenses Publiques dans les secteurs de la Santé, de la Nutrition, de l'Eau-Hygiène-Assainissement et de l'Education (PETS, 2019). L'enquête a été réalisée par l'Institut National de la Statistique (INS) en 2019 en collaboration avec l'UNICEF. Pour ce qui se ramène à la présente étude, cette enquête permet d'apprécier les incidences de la dépense publique consacrée au volet éducation sur l'efficacité du capital humain.

Dans cette perspective, des données détaillées sur les différentes dotations budgétaires et sur leurs contours d'utilisation ont donc été recueillies auprès des responsables des établissements retenus. Les informations sollicitées ont porté sur les effectifs, les enseignants, les taux de réussite, les taux de déperdition scolaire et les caractéristiques des bâtiments. Ces renseignements ont été utilisés pour identifier et suivre les indicateurs de performance interne. Plus de 90 % des écoles ciblées ont collaboré à l'enquête. Afin de garantir la représentativité des établissements et la fiabilité des données, l'enquête effectuée à partir du Journal des projets de l'exercice 2017 a privilégié, comme base de sondage, l'ensemble des projets inscrits dans le Budget d'Investissement Public (BIP) de l'année de référence. Toutefois, dans le cadre de la présente étude, seules les données relevant de l'enseignement secondaire sont exploitées.

b) Modèle Empirique D'estimation du Taux de Déperdition Scolaire

En rapport avec les formes fonctionnelles utilisées dans la littérature sur les dépenses en éducation, nous élaborons un modèle économétrique de régression inspiré de Gupta et al. (2002) pour mesurer les effets des dépenses publiques sur le taux de déperdition scolaire au secondaire. Ce modèle a été réadapté, afin de tenir compte de toutes les composantes du corps enseignant qu'on retrouve au Cameroun. Sa formulation est la suivante :

$$Deperdit\_{_i} = \beta_1 PLEG\_et\_autres_i + \beta_2 PCEG_{et}\, autres_i + \beta_3 IET\_et\_autres_i + \beta_4 Contractuel_i + \beta_5 Dotation\_loi\_fin_i + \beta_6 Dotation\_AD_i + \beta_7 construction/equip/infra_i + \beta_8 variables\ de\ control_i + \varepsilon_i$$

Ici, $Deperdit\_{_i}$ mesure l'efficacité du système éducatif. L'indice i représente l'établissement et renvoie au taux de déperdition, de redoublement ou d'abandon. $PLEG\_et\_autres_i$ représente le nombre de professeurs des lycées d'enseignement secondaire du second cycle et $PCEG_{\_et\_}autres_i$ celui du premier cycle. Les deux cycles sont concernés par l'enquête. Mais les particularités internes à chaque cycle sont considérées au cas par cas. De cette façon les facteurs propres à chaque niveau sont intégrés en permanence. Les variables sont alors contextualisées et analysées en fonction des biais qu'elles peuvent générées.

$Contractuel_i$ désigne le nombre d'enseignants contractuels dans un établissement. $Dotation\_loi\_fin_i$ est le montant de la dotation budgétaire inscrite dans la loi de Finances et $Dotation\_AD$, le montant de la dotation budgétaire inscrite dans l'autorisation de dépense. $Construction/equip/infra$ est l'ensemble de variables qui captent l'investissement public en termes de création de nouveaux établissements, de construction de salles de classe et latrines ou d'entretien infrastructurel. Enfin, ε_i est le terme d'erreur et β_i l'ensemble des paramètres à estimer. En plus des variables décrites dans le modèle, nous introduisons également des variables de contrôle pour prendre en compte les questions de gouvernance et de bonne gestion des ressources alloués au fonctionnement des établissements. La définition de ces paramètres du modèle est une caution de fiabilité pour la production des résultats de qualité.

IV. Résultats Empiriques

La mise en œuvre de la démarche méthodologique ci-dessus permet de générer des résultats mesurables comme le les statistiques

produites. Ces résultats ouvrent la voie à une discussion sur le financement public de l'éducation et ses effets sur l'efficacité dans la formation du capital humain au Cameroun.

a) Statistiques Descriptives

i. *Le Financement Public de L'éducation*

Pour cette section, les aspects sous revue s'examinent à l'aune de l'évolution du budget du MINESEC et de la part de l'éducation dans le budget global.

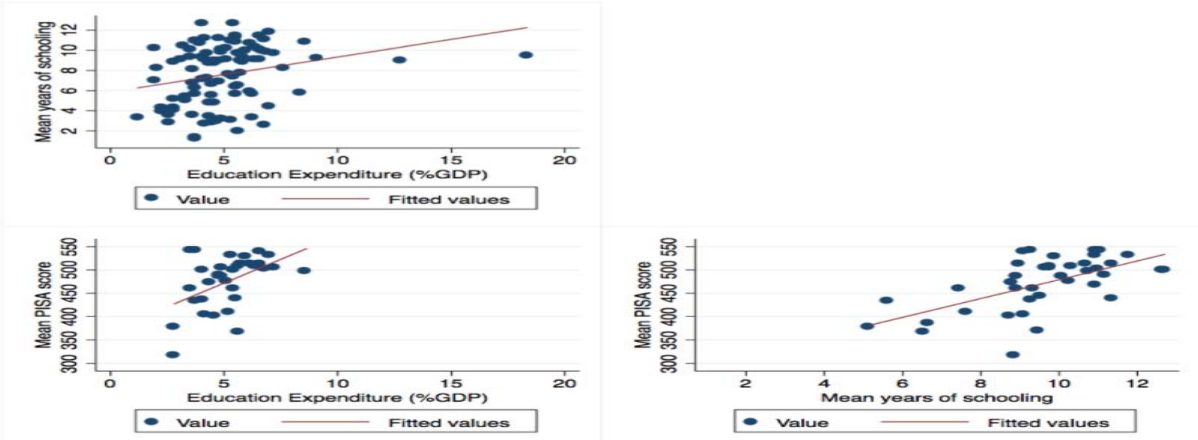
Tableau 1: Evolution du budget du MINESEC de 2013 à 2017 (en milliards de FCFA)

Budget	Année				
	2013	2014	2015	2016	2017
Budget de fonctionnement	203 163	211 837	226 978	224 444	295 383
Budget d'investissement	17 000	20 791	24 500	21 624	23 614
Budget total MINESEC	**220 163**	**232 628**	**251 478**	**246 068**	**318 997**
Part de l'éducation dans le budget global	12,1	12,4	11,7	10, 7	12,4
Part du MINESEC dans le budget de l'Etat (%)	**6,8**	**7,1**	**6,7**	**5,8**	**7,3**

Source: Auteur, extrait des lois de finances de 2013 à 2017

Le tableau 1 présente les dotations budgétaires allouées aux enseignements secondaires et la proportion qu'elles représentent dans le budget total de l'Etat. Dans son exploitation, il distingue le budget de fonctionnement du budget d'investissement. Il met en exergue la part du budget de l'Etat qui revient au secteur éducatif dans son ensemble. Ainsi, pour la période de référence, les enseignements secondaires ont reçu en moyenne 6,74 % du budget total par an. En s'intéressant au domaine de l'éducation au sens large, plusieurs départements ministériels rentrent en jeu. Il s'agit des ministères en charge de l'éducation de base, de l'enseignement supérieur, de la recherche scientifique, de la formation professionnelle, de l'éducation civique et de l'éducation physique. Les données du tableau révèlent alors qu'en tenant compte de ces aspects de l'éducation, la proportion annuelle moyenne du budget à considérer est de 11,86 %. Ces ressources propres associées aux fonds de coopération, permettent au Cameroun de maitriser les facteurs permissifs de la déperdition scolaire, ce d'autant plus que les enveloppes budgétaires d'éducation augmentent. Plus recemment encore, en ce qui renvoie au cas du MINESEC, la dotation est passée de 386,954 à 400,1 milliards de FCFA entre 2021 et 2022 (Lois de Finances 2022 et 2023).

Toutefois, outre les résultats de l'enquête PETS, les tests standardisés confirment l'existence d'une imbrication soutenue entre les allocations publiques et les performances du système éducatif.



Source: Auteur, à partir des données de World Bank Education Statistics (OCDE PISA, Barro Lee Education dataset, 2010)

Figure 1: Corrélation entre les résultats de l'éducation et les dépenses d'éducation

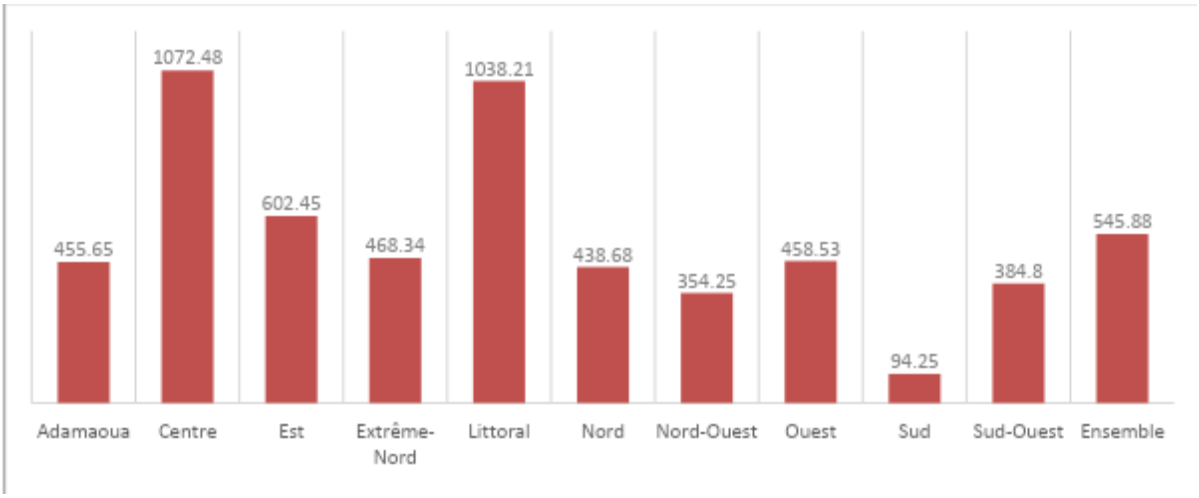
Les résultats de l'éducation sont généralement mesurés en termes de « quantité » (nombre d'années de scolarité) et de « qualité » (résultats d'apprentissage). La figure 1 ci-dessus présente trois diagrammes de dispersion utilisant les données de 2010 pour montrer la corrélation entre (i) les dépenses d'éducation (en part du PIB), (ii) les années moyennes de scolarisation et (iii) les résultats des tests du Programme international pour le suivi des acquis des élèves (PISA). Au niveau transversal, les dépenses d'éducation sont corrélées positivement avec les mesures de la quantité et de la qualité. Par la suite, elles sont reliées positivement entre elles. Ainsi, on conclut que les pays qui consacrent davantage de ressources publiques à l'éducation

obtiennent de meilleurs résultats en la matière. Cependant de nombreux facteurs affectent simultanément les dépenses d'éducation et les résultats. En effet, ces diagrammes montrent qu'en dépit de la corrélation positive générale, il existe une dispersion importante par rapport à la ligne de tendance. En d'autres termes, il existe une variation importante des résultats qui n'est pas prise en compte formellement par les différences de dépenses.

De la sorte, les données sur les dépenses correspondent aux dépenses publiques totales pour l'éducation en pourcentage du PIB (World Bank Education Statistics, 2010). Les données sur les scores PISA correspondent aux tests de 2010 dans les catégories mathématiques, lecture et sciences (OCDE PISA, 2010). Les données sur les années de scolarité correspondent aux années moyennes de scolarité en 2010 pour la population âgée de 15 ans et plus (Barro Lee Education dataset, 2010). Il faut alors recourir aux paramètres comme l'efficacité dans la formation car la quantité renseigne sur des masses sans qu'il ne soit possible de déterminer les apports fondamentaux sur l'évolution des agrégats économiques et sociaux.

ii. *Minimisation du Taux de Déperdition Scolaire*

Pour apprécier l'apport des dépenses publiques à la consolidation du capital humain éducatif à travers la réduction du taux de déperdition scolaire, nous examinons tour à tour, la politique infrastructurelle, celle des ressources humaines et celle des filets sociaux, qu'elles favorisent.



Source: Auteur, à partir des données du PETS 3, 2019

Figure 2: Montant moyen alloué à l'achat et à la maintenance des équipements et infrastructures (en milliers de Fcfa)

Les infrastructures (bâtiments, salles de classe, laboratoires et équipements) constituent des éléments essentiels à l'apprentissage. Elles facilitent un meilleur enseignement, renforce les acquis et limitent les cas d'abandon et de déperdition scolaire. Sur ce plan, les résultats du PETS 3 mettent en évidence la consistance du montant moyen alloué à l'achat et à la maintenance des équipements et infrastructures dans les établissements enquêtés. Toutefois, des disparités dans la péréquation de ces ressources apparaissent entre régions ainsi qu'entre zones urbaines et zones rurales. Par conséquent, il est indispensable pour les pouvoirs publics de juguler ces disparités afin de maîtriser les effets nocifs du phénomène d'abandon scolaire.

Tableau 2: Formation du personnel enseignant (général et technique ; 1er et 2nd cycle)

Variable	Obs	Moyenne	Variance	Min	Max
Personnel craie en main total	376	27,22	39,65	0	239
Personnel craie en main PLEG/PLET/PENI/PEPS Homme	376	12,95	22,62	0	182
Personnel craie en main PLEG/PLET/PENI/PEPS femmes	376	6.40	14.36	0	100
Personnel craie en main PCEG/PCET/PAENI/ PAEPS Homme	376	9.53	12.89	0	80
Personnel craie en main PCEG/PCET/PAENI/ PAEPS Femme	376	3.95	8.60	0	60
Personnel craie en main IET/MPEPS/MEPS/ MAEPS Homme	376	2,22	4,58	0	36

Personnel craie en main IET/MPEPS/MEPS/ MAEPS Femme	376	0,96	2,54	0	27
Personnel craie en main Contractuel Homme	376	1,01	3,21	0	46
Personnel craie en main contractuel Femme	376	0,4	1,16	0	8

Source: Auteur, à partir des données du PETS 3, 2019

Afin d'améliorer le contenu des enseignements et de constituer un capital humain de qualité, le gouvernement camerounais investit dans la formation, le recyclage et le déploiement des enseignants qualifiés au profit de l'ensemble des établissements publics d'enseignement secondaire du pays (francophone et anglophone). Le tableau 2 révèle ainsi que sur 389 établissements enquêtés, la moyenne échantillonnée compte 27 enseignants d'Etat environ. Une observation plus poussée du même tableau montre qu'en plus du personnel enseignant produit par les grandes écoles de formation, il existe un autre mode de recrutement des enseignants par voie de contractualisation. Ainsi, on observe que sur une population de 376 enseignants, 1% ont le statut de Contractuel, avec une faible proportion de femmes. Toutefois, l'Etat doit mettre un accent particulier sur les conditions de vie et de travail des enseignants comme acteurs privilégiés de la communauté éducative.

Tableau 3: Effectifs des Cas Sociaux

	Moyenne	Std. Dev.	Min	Max
Effectif total des cas sociaux	4,49	9,78	0	88
Effectif total des cas sociaux 1er cycle	3,16	6,65	0	72
Effectif total des cas sociaux 2ndr cycle	1,19	3,95	0	34

Source: Auteur, à partir des données du PETS 3, 2019

Le tableau 3 révèle qu'en 2017, le nombre moyen des cas sociaux était de 5 dans l'ensemble des communes. Cependant, certains établissements pouvaient cumuler jusqu'à 88 cas. En moyenne, trois cas étaient enregistrés au premier cycle et un seul au second. L'enquête fournit ainsi de précieuses informations sur la protection des « filets sociaux » comme stratégie innovante de développement au Cameroun. Ces derniers sont utilisés dans les champs de la protection sociale, de la lutte contre la pauvreté, des inégalités et des exclusions (Haile et Nino-Zarazua, 2018). Il s'agit des mesures qui reposent sur des programmes ou des transferts monétaires, sans contrepartie, en faveur des enfants vulnérables et des parents démunis. On y classe, la suppression de certains frais exigibles, la gratuité de l'école au primaire, la distribution des manuels scolaires, l'octroi des bourses au supérieur et diverses subventions.

b) Résultats des Estimations

Tableau 4: Analyse de la Corrélation Entre Taux de Déperdition Scolaire et Dépenses Gouvernementales

N°	Variable	1	2	3	4	5	6	7	8
1	Déperdition	1							
2	PLEG/PLET/PENI/PEPS_Index	-0.54*	1						
3	PCEG/PCET/PAENI/PAEPS_index	-0.41*	0.66*	1					
4	IET/MPEPS/MEPS/MAEPS_index	-0.23*	0.52*	0.46*	1				
5	Enseignant_Contractuel_index	-0.13	0.51*	0.46*	0.47*	1			
6	Dotation loi de finance	-0.29*	0.18*	0.10	0.11	0.06	1		
7	Dotation AD	-0.30*	0.19*	0.10	0.12	0.07	0.99*	1	
8	Achat/Equipment infrastructure	-0.43*	0.44*	0.25*	0.18	0.08	0.34*	0.31*	1

Source: Auteur, à partir des données du PETS 3, 2019

Le coefficient de corrélation linéaire donne une mesure de l'intensité et du sens de la relation linéaire entre deux variables. L'on s'intéresse à son interprétation en considérant sa valeur comprise entre -1 et 1. Plus sa valeur est proche de 1, plus la relation linéaire positive entre les variables est forte. Symétriquement, plus sa valeur est proche de -1, plus la relation linéaire s'établit dans le sens négatif. Plus le coefficient est proche de 000, plus la relation linéaire entre les variables est faible. Dans le cas de cette étude, les coefficients de corrélation varient entre -0.13 et 0.66, ce qui traduit l'existence d'une corrélation négative et significative entre le risque de déperdition scolaire et les variables relatives aux actions gouvernementales. Cela

signifie qu'une intensification de ces mesures contribue à réduire le risque d'abandon et les mauvais résultats scolaires qui conduisent au redoublement.

V. Conclusion et Recommandations

L'étude menée sur le lien entre les dépenses publiques d'éducation et la formation du capital humain a été féconde en termes d'enseignements. Fondée sur l'hypothèse selon laquelle, les dépenses publiques d'éducation améliorent l'efficacité dans la formation du capital humain à travers la réduction du taux de déperdition scolaire, elle a abouti à des résultats tangibles. Comme premier résultat, l'étude révèle qu'en facilitant l'ouverture de nouveaux établissements puis la construction et la réhabilitation des infrastructures éducatives des établissements existants, les fonds publics jugulent les contraintes (distance, coûts de la vie hors du cadre familial, etc.) qui justifient, bien souvent, le phénomène de décrochage scolaire.

Le deuxième résultat indique, quant à lui, que l'amélioration des conditions de vie et de travail des enseignants, les incline à mieux s'occuper des apprenants. Cette nouvelle citoyenneté s'accommode d'un réveil de conscience professionnelle profitable aussi bien aux apprenants qu'à la nation.

S'agissant du dernier résultat, il montre que les allocations gouvernementales assurent le droit à l'éducation pour tous. Dans ce cumul, l'on arrive à la maîtrise des barrières financières reconnues comme principales causes de déperdition scolaire.

Deux recommandations découlent de ces résultats. Premièrement, nonobstant le foisonnement de l'offre d'éducation des promoteurs privés, il faut davantage encourager le déploiement de l'action publique inclusive dans le domaine. Deuxièmement, il faut identifier les principales dimensions qui inscrivent les dépenses publiques dans des objectifs pragmatiques, au lieu de les limiter à leur opportunité.

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E-learning and the Professional Development of University Teachers in Morocco: Literature Review

By Yassine Hadj Sadek & Adil Boulahoual

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Summary- This literature review explores the impact of e-learning on the professional development of university teachers in Morocco. Through a analysis of existing studies, this work reveals that e-learning offers an unprecedented opportunity for the modernization of higher education, providing teachers with tools to enrich their practices and facilitating access to training.

This review highlights the importance of the training and continuous professional development of teachers for the successful integration of e-learning, It is crucial to provide teachers with the necessary resources, including access to technology, digital skills training and teaching support, to fully exploit the potential of e-learning.

Motsclés: e-learning, développement professionnel des enseignants, enseignement supérieur au maroc, accès à l'éducation, compétences numériques, innovation pédagogique, formation en ligne, infrastructure technologique, soutien aux enseignants.

GJHSS-G Classification: JEL Codes: I23, I25, O33, J24

Strictly as per the compliance and regulations of:

E-learning and the Professional Development of University Teachers in Morocco: Literature Review

E-learning et le Développement Professionnel des Professeurs Universitaires au Maroc: Revue de Littérature

Yassine Hadj Sadek [α] & Adil Boulahoual [σ]

Résumé- Cette revue de littérature explore l'impact du e-learning sur le développement professionnel des enseignants universitaires au Maroc. Grâce à une analyse approfondie des études existantes, ce travail révèle que le e-learning offre une opportunité sans précédent pour la modernisation de l'enseignement supérieur, en fournissant aux enseignants des outils pour enrichir leurs pratiques et en facilitant l'accès à la formation.

Cette revue souligne l'importance de la formation et du développement professionnel continu des enseignants pour une intégration réussie du e-learning, Il est crucial d'offrir aux enseignants les ressources nécessaires, y compris l'accès à la technologie, la formation aux compétences numériques et le soutien pédagogique, pour exploiter pleinement le potentiel du e-learning.

Face aux enjeux identifiés, cet article appelle à des recherches futures pour évaluer de manière empirique l'impact du e-learning sur le développement professionnel des enseignants et pour explorer les stratégies permettant d'optimiser son utilisation dans le contexte universitaire marocain.

Summary- This literature review explores the impact of e-learning on the professional development of university teachers in Morocco. Through a analysis of existing studies, this work reveals that e-learning offers an unprecedented opportunity for the modernization of higher education, providing teachers with tools to enrich their practices and facilitating access to training.

This review highlights the importance of the training and continuous professional development of teachers for the successful integration of e-learning, It is crucial to provide teachers with the necessary resources, including access to technology, digital skills training and teaching support, to fully exploit the potential of e-learning.

Faced with the challenges identified, this article calls for future research to empirically assess the impact of e-learning on the professional development of teachers and to explore strategies for optimizing its use in the Moroccan academic context.

Motsclés: e-learning, développement professionnel des enseignants, enseignement supérieur au maroc, accès à l'éducation, compétences numériques, innovation pédagogique, formation en ligne, infrastructure technologique, soutien aux enseignants

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I. Introduction

La déclaration de l'état d'urgence sanitaire au Maroc en mars 2020 a conduit les universités à adopter l'enseignement à distance pour assurer la continuité pédagogique(Ferhane & Yassine, 2022), le Maroc a opté pour l'enseignement à distance ou le e-learning pendant la crise du Covid-19, et a fermé les infrastructures éducatives, y compris les universités, dans le cadre des mesures visant à limiter la propagation de la crise sanitaire de Covid-19 pour assurer la continuité du processus éducatif (Charef et al., 2023).

Depuis lors, L'adoption croissante du E-learning dans les universités marocaines est devenue un sujet important d'intérêt dans le domaine de l'enseignement supérieur (Brika et al., 2022). Avec les avancées technologiques et la disponibilité croissante de l'accès à Internet, l'e-learning est apparu comme une alternative prometteuse aux méthodes d'apprentissage traditionnelles en salle de cours (Naveed et al., 2020). Cette approche pédagogique novatrice a considérablement modifié la façon dont les enseignants dispensent leurs cours et dont les étudiants apprennent (Timperley, 2011).

Dans ce contexte, il est essentiel d'examiner attentivement l'impact de l'e-learning sur le développement professionnel des enseignants universitaires au Maroc, Cet article vise à explorer les dimensions multiples du e-learning dans le contexte spécifique des universités marocaines, en se concentrant sur son influence sur le développement professionnel des enseignants. L'objectif est de comprendre comment le e-learning peut être intégré efficacement dans la formation continue des enseignants au Maroc, et comment il peut contribuer à l'amélioration de leurs compétences pédagogiques.

II. Méthodologie

Cet article adopte la forme *d'une revue de littérature narrative (Green et al., 2006),* cette approche narrative nous permet de souligner les tendances émergentes, de discuter des thématiques clés et de proposer des pistes de réflexion pour des recherches futures dans le contexte spécifique de l'enseignement

supérieur au Maroc, la recherche a été effectuée dans diverses bases de données académiques, les critères d'inclusion des articles dans cette revue ont été définis tel que toute revue qui aborde le E-learning et le développement professionnel des enseignants universitaires dans un contexte marocain soit traitée, l'analyse thématique a permis de réaliser un arbre thématique (Martineau & Plard, 2016) ,

III. Cadre Théorique

L'avènement du e-learning représente une révolution dans les modalités d'apprentissage et d'enseignement, offrant une flexibilité, une accessibilité et une personnalisation accrues des parcours éducatifs. La littérature sur l'apprentissage en ligne (Arkorful & Abaidoo, 2014) souligne sa capacité à transcender les limites géographiques et temporelles, facilitant ainsi un accès élargi aux ressources éducatives et aux communautés d'apprentissage(Alilouch et al., 2020).

Dans le contexte marocain, où l'évolution des infrastructures numériques rencontre une volonté croissante de modernisation pédagogique, le e-learning se positionne comme un levier stratégique pour le développement professionnel des enseignants universitaires (Benzina & Chafik, 2023). Ce développement, nécessite une exploration des méthodes pédagogiques qui valorisent l'autonomie de l'apprenant et la construction collaborative du savoir. Cette approche est en adéquation avec les principes du *constructivisme social* qui prône l'apprentissage comme un processus social et interactif, elle met en évidence le rôle des interactions sociales dans le processus d'apprentissage, proposant que la connaissance est construite socialement. Cette théorie est appliquée au E-learning pour encourager des approches pédagogiques qui favorisent la collaboration et le dialogue entre enseignants, enrichissant leur développement professionnel par le partage d'expériences et de réflexions pédagogiques (Vygotsky & Cole, 1978).

Siemens introduit *le connectivisme* comme une théorie de l'apprentissage pour l'ère numérique, soulignant l'importance des réseaux sociaux et technologiques dans l'acquisition de connaissances, le connectivisme est crucial pour comprendre comment le E-learning peut faciliter le développement professionnel en permettant aux enseignants de se connecter, d'échanger des idées et de collaborer à travers des plateformes numériques (Siemens, 2005).

Une autre théorie, la théorie de la transformation des pratiques pédagogiques, offre un cadre pour comprendre les impacts profonds que l'intégration des technologies numériques et des nouvelles stratégies pédagogiques peut avoir sur l'enseignement et l'apprentissage, telle qu'explorée par (Borthwick et al., 2022), elle souligne également l'importance de l'amélioration continue dans l'éducation, cela signifie que les universités et le corps professoral doivent s'engager dans un processus d'évaluation et de réflexion constant sur leurs pratiques, avec l'objectif de les affiner et de les améliorer en continu(Timperley, 2011). L'amélioration continue repose sur la collecte de feedback, l'analyse des résultats d'apprentissage des étudiants, et l'ajustement des stratégies pédagogiques en fonction des besoins identifiés, ce processus dynamique assure que l'enseignement reste pertinent, efficace, et aligné sur les standards éducatifs les plus élevés (Fullan, 2007).

Ce modèle présente une opportunité sans précédent pour révolutionner l'enseignement supérieur au Maroc (Bouyzem et al., 2022), en adoptantl'E-learning et en s'engageant dans un cycle d'amélioration continue, les enseignants peuvent non seulement enrichir leur propre développement professionnel, mais aussi améliorer significativement la qualité de l'enseignement (El Mustapha & El Adnani, 2022).

Le e-learning favorise une culture de collaboration et de partage de connaissances parmi les enseignants, en offrant des plateformes pour l'échange d'idées, la cocréation de contenus et le développement de projets communs, ce paradigme s'aligne avec *la théorie de l'apprentissage social,* qui valorise les interactions sociales et le travail collaboratif comme moteurs du développement professionnel et qui explique comment la croyance en ses propres capacités à exécuter des tâches influence la motivation et la performance (Bandura, 1977), et le renforcement de l'auto-efficacité des enseignants pour encourager l'adoption du E-learning et contribuer ainsi à l'enrichissement de l'apprentissage des professeurs et à l'amélioration de la qualité de l'éducation (El Mustapha & El Adnani, 2022).

Ces modèles offrent un cadre théorique approfondie sur la manière dont le e-learning peut impacter le développement professionnel des enseignants, et transformer les pratiques dans les universités marocaines

IV. Résultats

Les institutions d'enseignement supérieur marocaines ont été confrontées à des défis majeurs pour maintenir la continuité pédagogique, poussant les enseignants à rechercher activement des solutions externes pour l'enseignement en ligne et favorisant un apprentissage collaboratif accéléré parmi le corps professoral (Benseddik, 2020) et une offre d'opportunités significatives pour l'innovation et l'amélioration pédagogique (Outoukarte et al., 2023)

Alors commença dans les universités marocaines l'usage d'une variété d'outils pour faciliter à la fois la communication synchrone, comme les vidéoconférences via Zoom, Microsoft Teams ou

Google Meet, et asynchrone, à travers des forums de discussion, des e-mails, des Ressources Éducatives Ouvertes (REO), des contenus multimédias et des systèmes de messagerie intégrés aux « Learning Management System » (LMS) (Elmouhtarim, 2021), ces technologies permettent des interactions en temps réel, essentielles pour les séances de cours, les conférences et les discussions en groupe, tout en offrant également des espaces pour des échanges flexibles, adaptés aux contraintes de temps des participants(Outoukarte et al., 2023), et complètent les manuels traditionnels et les lectures.

L'usage des plateformes comme YouTube pour les vidéos éducatives, Khan Academy pour les tutoriels, et les bibliothèques numériques pour l'accès aux journaux et articles scientifiques, devinrent fréquemment utilisées (Zouiri & Kinani, 2022).

L'évaluation des apprentissages a également migré en ligne, avec l'adoption d'outils permettant de créer et de gérer des tests et examens en ligne (Alami & El Idrissi, 2022). Ces outils, souvent intégrés dans les LMS, permettent aux enseignants de concevoir des questionnaires à choix multiples, des réponses courtes, ou des devoirs à soumettre, facilitant ainsi le suivi des progrès des étudiants et la fourniture de retours constructifs (Elmouhtarim, 2021).

Les opportunités du déploiement du e-learning au Maroc sont vastes et représentent un potentiel significatif pour transformer le paysage éducatif, le e-learning introduit des opportunités pour l'adoption de méthodes d'enseignement innovantes, y compris l'apprentissage inversé et l'apprentissage basé sur les compétences, qui répondent aux besoins spécifiques des apprenants marocains (Charef et al., 2023).

Le e-learning facilite le développement de collaborations et partenariats internationaux, permettant aux institutions marocaines d'enrichir leur offre éducative et de s'inscrire dans une dynamique d'échange académique mondial (Charef et al., 2023), qui à son tour permet aux établissements d'enseignement supérieur du Maroc de moderniser leurs plateformes d'e-learning et d'adopter des méthodologies d'enseignement novatrices, par le biais d'échanges avec des institutions étrangères reconnues dans le domaine de l'e-learning, l'intégration d'approches pédagogiques collaboratives et d'éléments multimédias dans les cours en ligne est recommandée pour enrichir le développement professionnel à travers le e-learning (Kulal & Nayak, 2020), les universités marocaines tirent inspiration de pratiques pédagogiques de premier plan, favorisant ainsi une culture d'excellence et d'innovation au sein de leurs propres cadres éducatifs (Nouib et al., 2022).

Cette modalité d'apprentissage a le potentiel de diminuer les inégalités d'accès à l'éducation, en rendant disponible des ressources pédagogiques de qualité pour une audience plus vaste, indépendamment des barrières géographiques (Bahja et al., 2022; Naciri et al., 2021), Cela ouvre la voie à une éducation plus inclusive et accessible à tous les segments de la population marocaine, y compris les personnes vivant dans des régions éloignées ou défavorisées (Lahmine et al., 2014) et en fournissant aux acteurs de l'éducation les infrastructures adéquates et en les incitant à intégrer ces technologies dans leurs méthodes d'enseignement et d'apprentissage, les universités marocaines aspirent à atténuer la fracture numérique et à promouvoir l'inclusion sociale(Alami & El Idrissi, 2022).

Mais plusieurs obstacles ont été rencontrés dans la mise en œuvre du E-learning dans le contexte marocain, les défis tels que l'accès inégal à Internet et les limitations infrastructurelles, soulignant la nécessité d'une infrastructure technologique fiable pour soutenir le E-learning (Yue et al., 2023).

La précipitation vers l'adoption du e-learning a mis en lumière un déficit de préparation chez les enseignants, nécessitant une adaptation rapide à ces nouvelles pratiques (Elfirdoussi et al., 2020), les recherches ont montré qu'ils ont besoin de plus de formation et de soutien pour utiliser efficacement le e-learning dans leur enseignement (Roussi & Houmam, 2021). Les études ont souligné l'importance de la recherche continue pour évaluer l'efficacité de l'utilisation des TIC dans l'enseignement supérieur et pour identifier les meilleures pratiques pour surmonter les défis restants(Toumi et al., 2014).

Les étudiants peuvent également rencontrer des difficultés à s'adapter à l'apprentissage en ligne, notamment en raison du manque de familiarité avec les technologies et des défis liés à l'auto-discipline et à la gestion du temps, des programmes d'orientation et de soutien spécifiques sont nécessaires pour les aider à réussir dans ce nouvel environnement d'apprentissage (Zidani & Belkhir, 2020).

La formation initiale des enseignants universitaires au Maroc est souvent axée sur les connaissances disciplinaires, mais il est de plus en plus reconnu que des compétences pédagogiques solides sont également essentielles (El Aissaoui & Elkharraz, 2023). Les programmes de formation continue offrent aux enseignants l'occasion d'acquérir de nouvelles compétences en matière d'enseignement et d'apprentissage, ainsi que de se familiariser avec les dernières tendances et technologies éducatives (Charef et al., 2023).

Le développement professionnel au sein du milieu universitaire marocain se trouve à un stade de transformation majeure, marqué par une progression vers des méthodologies pédagogiques avant-gardistes et l'assimilation des technologies digitales, malgré cet élan, le chemin reste entravé par plusieurs obstacles, notamment le manque de ressources et une infrastructure pédagogique déficiente, questionnant la capacité du système d'enseignement supérieur à répondre adéquatement aux aspirations de

développement professionnel de ses enseignants (Wei et al., 2009).

L'évolution rapide vers la digitalisation de l'enseignement souligne l'urgence pour les enseignants d'acquérir des compétences élevées dans les technologies de l'information et de la communication (TIC), la conception de cours en ligne, et des stratégies d'enseignement qui privilégient un apprentissage centré sur l'étudiant(Halimi, 2023), Il est également crucial de développer une connaissance approfondie des dynamiques du E-learning pour orchestrer des expériences éducatives captivantes et productives (Guskey, 2002; Oulmaati et al., 2020).

L'orientation vers le e-learning est parfois confrontée à des *résistances culturelles et institutionnelles,* ce qui peut limiter son adoption à grande échelle (Bouhafs, 2021), cette résistance est identifiée comme une barrière notable à l'innovation pédagogique numérique (Al-Jardani, 2020), les résistances au changement et les préoccupations concernant l'E-learning posent des défis majeurs, pour surmonter ces barrières, il est crucial de cultiver une attitude positive envers la technologie, d'assurer un accompagnement technique systématique, et de développer des contenus pédagogiques numériques captivants et pertinents (Zheng et al., 2021).

Les études ont également montré que les politiques publiques peuvent jouer un rôle important dans la promotion de l'utilisation des TIC dans l'enseignement supérieur, en fournissant des subventions pour l'achat d'équipements, en offrant des programmes de formation pour les enseignants et en établissant des partenariats public-privé pour développer des infrastructures numériques (Bouyzem et al., 2022), le *soutien institutionnel* est un facteur important pour l'adoption réussie du e-learning, les enseignants ont exprimé le besoin d'un soutien institutionnel accru pour améliorer la qualité de l'enseignement en ligne et pour faciliter l'accès à la technologie pour les étudiants (Bouyzem et al., 2021).

Le e-learning est identifié comme un vecteur crucial pour le développement professionnel, enrichissant l'expérience d'apprentissage des enseignants par des interactions sociales, cognitives et pédagogiques approfondies (Bebbouchi - Ben El Kezadri, 2022). L'utilisation de la plateforme e-learning par les enseignants et étudiants a révélé d'importantes évolutions dans les pratiques pédagogiques, notamment en termes de compétences d'auto-apprentissage, de motivation étudiante et d'interactions sociales, illustrant ainsi l'impact positif du e-learning sur le milieu éducatif universitaire (Bouhafs, 2021; Oulmaati et al., 2020), L'adoption de méthodes pédagogiques collaboratives et l'inclusion d'éléments multimédias dans les cours en ligne sont recommandées pour enrichir le développement professionnel à travers le e-learning (Kulal & Nayak, 2020).

L'adoption du e-learning dans l'enseignement supérieur marocain révèle un impact profond sur le développement professionnel des enseignants, offrant de nouvelles avenues pour l'apprentissage, la collaboration et l'interaction, Cette modalité d'enseignement digital favorise un accès étendu à diverses ressources pédagogiques et introduit une flexibilité sans précédent dans la structuration des programmes de formation,(Hayat et al., 2021). Le e-learning se distingue par sa capacité à permettre une immersion professionnelle continue, libre des contraintes traditionnelles de temps et d'espace, tout en cultivant une culture de collaboration et de partage parmi le corps enseignant (Ferhane & Yassine, 2022).

Le paysage actuel du e-learning au Maroc est caractérisé par une dynamique d'évolution et d'adaptation significative, en réponse aux impératifs éducatifs contemporains, ce secteur, en plein essor, se heurte néanmoins à des obstacles structurels**,** tout en offrant la promesse de transformations profondes dans le domaine éducatif (Ibrahimi et al., 2014), pour maximiser le potentiel du e-learning, il est crucial de s'attaquer aux défis liés à l'accès technologique, à l'acquisition de compétences numériques, à la résistance au changement, et à l'assurance de la qualité des programmes(Maphosa et al., 2023).

V. Discussion

L'examen approfondi de la littérature révèle des implications substantielles tant pour la pratique pédagogique que pour la théorisation en éducation, sur le plan pratique, l'assimilation du e-learning au sein des initiatives de développement professionnel promet d'affiner les stratégies d'enseignement et d'améliorer substantiellement les performances étudiantes (Krome, 2021), Les recherches examinées mettent en évidence l'importance de la formation pédagogique initiale et continue, de l'accès aux technologies, de la collaboration entre pairs, et de la qualité des ressources éducatives en ligne, en facilitant un accès élargi aux ressources de formation via des plateformes numériques, équipe les enseignants avec des méthodologies novatrices alignées sur les tendances pédagogiques contemporaines (Bebbouchi - Ben El Kezadri, 2022).

Le e-learning remet en question les paradigmes éducatifs traditionnels en privilégiant des approches centrées sur l'apprenant plutôt que sur l'enseignant (Agabi, 2019). Cette transition vers des expériences d'apprentissage personnalisées offre aux enseignants la latitude de répondre aux divers besoins des étudiants tout en stimulant leur engagement actif et le développement de compétences critiques, alignant ainsi la pratique avec les principes constructivistes qui valorisent l'apprentissage par l'expérience (Toumi et al., 2014).

Les méthodes conventionnelles d'enseignement, lorsqu'appliquées dans un contexte e-learning, exigent une réadaptation significative pour maintenir leur efficacité, Les enseignants sont appelés à engager les étudiants dans un environnement virtuel par le biais d'activités interactives et de retours opportuns, nécessitant un changement profond dans les approches pédagogiques et le développement de nouvelles compétences (Benaini, 2023),

L'intégration réussie des nouvelles technologies dans l'enseignement nécessite une adaptation significative de la part des enseignants. Ce processus d'adaptation va au-delà de la simple acquisition de compétences techniques; il implique une remise en question et une évolution des croyances pédagogiques et des pratiques d'enseignement traditionnelles (Laadem, 2017). Les enseignants sont appelés à devenir des facilitateurs du changement plutôt que des dépositaires du savoir, encourageant ainsi une approche plus centrée sur l'apprenant et basée sur l'exploration et la découverte (Oulmaati et al., 2017).

Le développement professionnel des enseignants via l'e-learning présente de nombreux enjeux et défis qui doivent être pris en compte pour assurer son efficacité et son succès. Tout d'abord, l'e-learning offre aux enseignants la possibilité de développer leurs compétences pédagogiques et technologiques, ce qui peut améliorer leur pratique professionnelle, Cependant, cette transition vers l'e-learning nécessite une adaptation des enseignants aux nouvelles technologies, ce qui peut être un défi pour ceux qui ne sont pas familiers avec l'utilisation des outils numériques(Oulmaati et al., 2020; Yue et al., 2023).

Un autre enjeu important est la nécessité de garantir la qualité des formations dispensées via l'e-learning, les enseignants doivent être formés à la conception de cours en ligne et à l'utilisation des plateformes d'apprentissage numérique afin de fournir un contenu pédagogique efficace et engageant, il est crucial de concevoir des programmes en ligne interactifs et stimulants qui favorisent la participation active (Zheng et al., 2021). L'inclusion de contenus multimédias, la gamification, les forums de discussion, et les feedbacks temps réel sont des éléments essentiels pour des cours en ligne engageants (Frehywot et al., 2013), il est important de fournir un soutien technique et pédagogique aux enseignants pour les aider à surmonter les défis liés à l'utilisation des technologies éducatives et à la mise en œuvre de pratiques pédagogiques innovantes(Hantem, 2020)et la mise en place de services de support technique, (Oulmaati et al., 2017).

Le potentiel du e-learning pour réduire les inégalités d'accès à l'éducation au Maroc est entravé par un paradoxe: d'un côté, il offre la possibilité de fournir des ressources pédagogiques de qualité à une audience plus large, indépendamment des barrières géographiques, ce qui pourrait favoriser une éducation inclusive pour tous, y compris les populations vivant dans des zones défavorisées (Lahmine et al., 2014). Cependant, les défis liés à l'accès inégal à Internet et aux limitations infrastructurelles, notamment dans les régions rurales, soulignent la nécessité d'investir dans des infrastructures technologiques robustes pour garantir une expérience d'apprentissage en ligne efficace et équitable (Bahja et al., 2022; Giannakos et al., 2022).

Par ailleurs, le développement professionnel via l'e-learning soulève également des questions liées à l'accès à la technologie et à la connectivité dans les universités marocaines, Il est crucial de garantir que tous les enseignants aient accès aux équipements informatiques nécessaires ainsi qu'à une connexion Internet fiable pour pouvoir bénéficier pleinement du potentiel offert par l'e-learning. Sans ces ressources adéquates, certains enseignants risquent d'être exclus du processus de développement professionnel via l'e-learning (Belkhou et al., 2023).

Les universités doivent également promouvoir un environnement institutionnel qui encourage activement les enseignants à explorer le e-learning pour leur développement professionnel, la reconnaissance des efforts d'innovation pédagogique et la fourniture d'incitations, telles que le soutien à la formation et à la participation à des conférences en ligne, sont déterminantes pour motiver les enseignants(Bouyzem et al., 2021), les universités doivent mettre en place des mécanismes de soutien et d'encadrement pour aider les enseignants à s'adapter aux nouvelles modalités du E-learning (Roussi & Houmam, 2021), en plus, il est essentiel d'évaluer régulièrement les programmes de formation en ligne pour s'assurer qu'ils répondent aux besoins des enseignants et qu'ils favorisent leur développement professionnel(Chaatit et al., 2013).

La collaboration entre les institutions d'enseignement supérieur et les entreprises technologiques est cruciale pour accéder à des outils avancés et développer des solutions e-learning sur mesure pour les besoins spécifiques des enseignants marocains, les enseignants peuvent bénéficier de la participation à des communautés d'apprentissage professionnelles où ils peuvent échanger des idées, partager des bonnes pratiques et recevoir un soutien de leurs pairs (Bebbouchi - Ben El Kezadri, 2022; Routabi & Bennani, 2022). Ces communautés peuvent être formelles, telles que des groupes de travail départementaux, ou informelles, telles que des réseaux professionnels en ligne (Boulos et al., 2021). la création collaborative de contenus pédagogiques en ligne, encourageant ainsi le partage des bonnes pratiques et la collaboration entre pairs. Les webinaires et les ateliers virtuels peuvent également être utilisés pour faciliter l'interaction entre les enseignants et favoriser l'échange d'idées et d'expériences. (Keese et al., 2023).

Cette collaboration ouvre la voie à des opportunités significatives de formation et de développement professionnel pour les enseignants et chercheurs marocains, leur permettant d'acquérir de nouvelles compétences et de se tenir au courant des dernières tendances dans le domaine de l'e-learning (Riyami, 2018), les partenariats stratégiques formés avec des entités éducatives de renommée internationale facilitent des projets de recherche conjoints, des échanges académiques, et des initiatives d'innovation collaborative, enrichissant ainsi l'écosystème éducatif et ouvrant de nouvelles opportunités pour la communauté académique(Toprak & genç kumtepe, 2014).

Les stratégies de développement professionnel déployées dans les établissements d'enseignement supérieur marocains sont variées, incluant des ateliers, séminaires et initiatives de mentorat, Cependant, ces méthodes souffrent souvent d'un manque de cohérence et de continuité, ne parvenant pas toujours à embrasser l'intégralité des compétences requises à l'ère numérique, les formations dispensées, quoique bénéfiques, manquent de suivi pour une intégration pérenne des acquis dans les pratiques enseignantes (Charef et al., 2023).

L'adoption de stratégies de développement professionnel transformatrices, telles que la participation à des formations en ligne de qualité, l'exploration de nouvelles méthodologies pédagogiques et la collaboration avec les pairs pour le partage des meilleures pratiques, est essentielle pour actualiser les compétences enseignantes et stimuler l'innovation dans l'enseignement universitaire(Meskine & Ouafa, 2023; Riyami, 2018).

Le système actuel révèle plusieurs lacunes, notamment l'absence de parcours de développement professionnel personnalisés qui tiennent compte des besoins individuels et des spécificités disciplinaires (Guskey, 2002). De plus, il existe un manque significatif d'évaluation des programmes de formation, rendant difficile la mesure de leur impact sur l'amélioration des compétences pédagogiques et technologiques des enseignants. Cette situation est exacerbée par une reconnaissance institutionnelle insuffisante du développement professionnel, ce qui peut limiter la motivation des enseignants à s'engager dans ces activités de formation continue(Darling-Hammond & Richardson, 2009).

Plusieurs problématiques liées à l'enseignement supérieur au Maroc, notamment la massification de la demande face à l'exigüité des amphis, le faible taux d'encadrement, les taux d'échec et d'abandon élevés, la démotivation des étudiants, la difficulté d'intégrer le marché de l'emploi par les diplômés des établissements à accès ouvert, le manque de formations continues au personnel administratif et académique dans le but de développer leurs capacités professionnelles et les conditions de travail inappropriées. Le e-learning est considéré comme une solution pour remédier à certains de ces obstacles, notamment celui de la massification et du faible taux d'encadrement (Boumahdi, 2021).

L'efficacité du e-learning dans l'amélioration du développement professionnel des enseignants universitaires au Maroc est influencée par une gamme de facteurs essentiels. Parmi ceux-ci, l'accès à des infrastructures technologiques robustes et la maîtrise par les enseignants de ces outils numériques sont prépondérants pour le succès de l'e-learning (Bahja et al., 2022). l'application efficace du e-learning est entravée par des défis techniques, notamment l'accès limité à des technologies adéquates et à une infrastructure fiable (Bahja et al., 2022; Giannakos et al., 2022). Il est donc primordial de former spécifiquement les enseignants pour surmonter ces obstacles et pour intégrer efficacement les stratégies pédagogiques en ligne (Zheng et al., 2021).

Dans le cadre de cette étude, nous avons élaboré un cadre théorique conceptuel pour comprendre les dynamiques du développement professionnel des enseignants universitaires à travers le e-learning. Ce cadre, représenté dans la Figure 1, illustre les différentes composantes théoriques qui sous-tendent notre analyse.

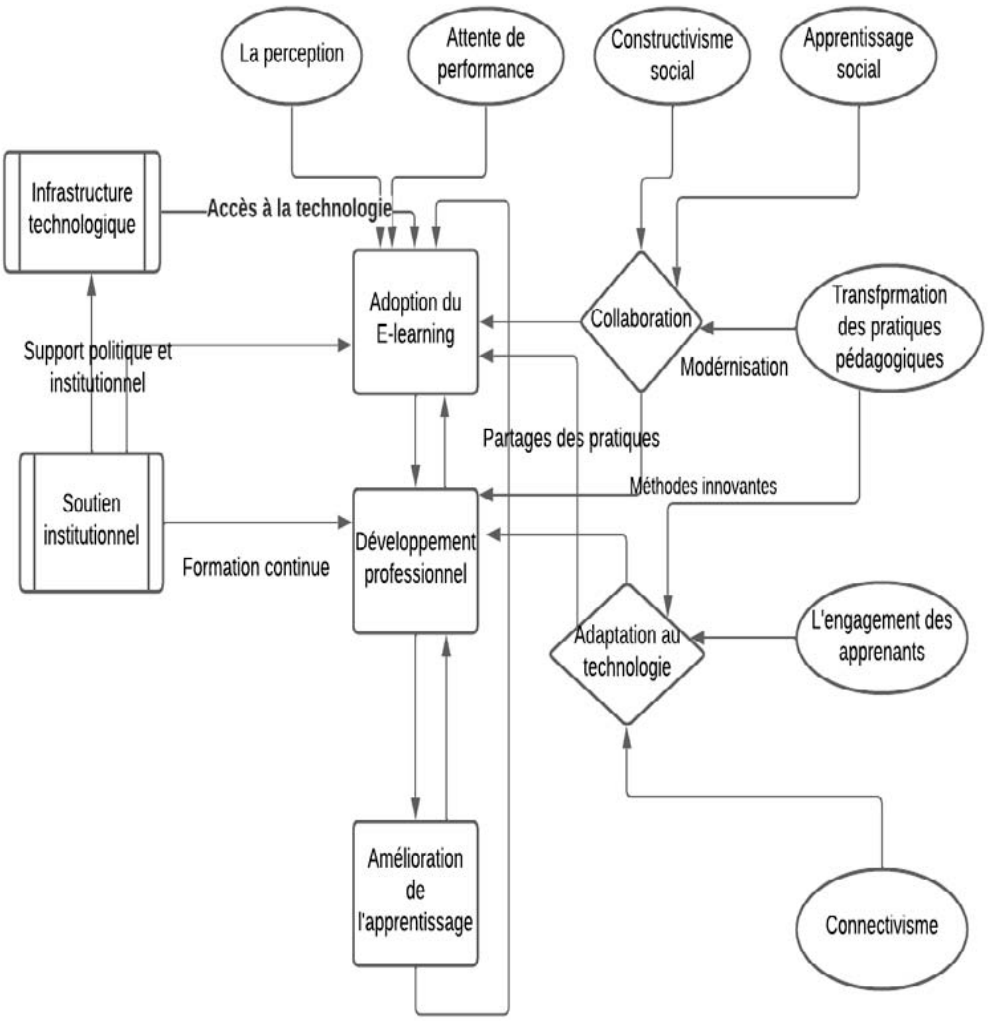

Figure 1: Cadre conceptuel théorique

Le secteur du e-learning est sujet à des changements technologiques rapides, ce qui peut rendre certaines des études analysées rapidement obsolètes (Al-Jardani, 2020).

La recherche se limite principalement aux articles disponibles dans des bases de données spécifiques, publiés en anglais et en français, cela peut exclure des travaux pertinents publiés dans d'autres langues ou sources limitant ainsi la portée des conclusions, les études examinées emploient une variété de méthodologies, rendant difficile la comparaison directe des résultats et la synthèse de conclusions globales.

Toute fois la formation continue des enseignants sur l'utilisation pédagogique des technologies e-learning est un élément clé de leur développement professionnel qui nécessite une approche holistique qui englobe à la fois les aspects technologiques et pédagogiques du e-learning(Meskine & Ouafa, 2023).

VI. Conclusion

L'examen approfondi de la littérature révèle que le e-learning représente une avenue prometteuse pour transformer de manière significative le développement professionnel au sein des universités marocaines. En affrontant de front les obstacles relatifs à l'infrastructure technologique, à la maîtrise des outils numériques par les enseignants, au manque de soutien institutionnel et à l'absence de partenariats stratégiques avec les acteurs de la technologie éducative, les institutions d'enseignement supérieur au Maroc sont en position de tirer pleinement parti des opportunités offertes par le E-learning (Bouyzem et al., 2021). Ce faisant, elles peuvent catalyser un développement professionnel soutenu et dynamique parmi leur corps enseignant, ce qui est essentiel pour la rénovation des méthodologies d'enseignement et l'enrichissement de l'expérience d'apprentissage étudiante (Bahja et al., 2022).

La collaboration entre les universités marocaines et les entreprises spécialisées dans les

technologies de l'éducation ouvre également de nouvelles perspectives pour l'élaboration et la mise en œuvre de solutions e-learning sur mesure (Bouyzem et al., 2022). Ces partenariats peuvent faciliter l'accès à des outils pédagogiques avancés et à des plateformes d'apprentissage interactives, permettant ainsi aux enseignants d'explorer et d'intégrer des stratégies d'enseignement innovantes qui répondent aux besoins diversifiés des étudiants.

Le potentiel du e-learning pour redéfinir le développement professionnel des enseignants universitaires au Maroc est considérable. En surmontant les défis existants et en exploitant stratégiquement les ressources disponibles, les universités peuvent promouvoir un environnement d'apprentissage enrichi et adaptatif. Cette évolution pédagogique ne se limite pas à l'amélioration des compétences enseignantes mais s'étend aux résultats d'apprentissage des étudiants, contribuant ainsi de manière significative à l'avancement de l'enseignement supérieur au Maroc.

Les travaux de recherche actuels offrent une base de connaissances enrichissante; néanmoins, l'exploration empirique approfondie reste essentielle pour saisir l'impact durable du e-learning sur le perfectionnement des enseignants universitaires au Maroc (Alami & El Idrissi, 2022), ces études futures devraient viser à évaluer de manière empirique l'efficacité de différentes approches pédagogiques en ligne, à comprendre les défis spécifiques rencontrés par les enseignants dans l'adoption de ces technologies, et à identifier des stratégies pour améliorer l'accès et la participation des étudiants dans un environnement d'apprentissage virtuel.

La poursuite de recherches dans ces domaines contribuera non seulement à une meilleure compréhension des implications du e-learning pour le développement professionnel mais fournira également des directives pratiques pour optimiser son application dans le contexte universitaire marocain.

Liste des Abréviations

ICT: Technologies de l'information et de la communication (Technologies de l'Information et de la Communication)

LMS: Système de gestion de l'apprentissage (Learning Management System)

REO: Ressources éducatives ouvertes (Open Educational Resources)

MOOC: Cours en ligne ouverts et massifs (Massive Open Online Course)

Formulaire de garanti des auteurs: Tous les auteurs mentionnés ont suffisamment contribué au travail soumis et que le contenu du manuscrit n'a jamais été publié.

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3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

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5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.
Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

19. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

20. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

21. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

22. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

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Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

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Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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