# Description

This research paper develops and validates a framework for systematically assessing, predicting, and enhancing information engagement (IE) in digital platforms. IE refers to how users interact with and respond to digital information and is an important aspect of user experience.

While IE is significant, little research has examined how to measure or improve it. This paper addresses that gap by utilizing computational linguistics and cognitive psychology. Specifically, we:

1) Conceptually define IE and identify key dimensions of perception, participation, and perseverance based on an interdisciplinary literature review.

2) Develop a predictive model (the READ model) that uses textual attributes like representativeness, ease of use, affect, and distribution to forecast word engagement levels.

3) Create a prescriptive model that employs natural language processing to automatically replace words with more engaging synonyms.

We conduct three main studies: an exploratory analysis of how phrasing impacts IE; creation and validation of the READ predictive model; and randomized trials demonstrating the prescriptive model's ability to enhance IE dimensions.

Overall, this analytical creativity research synthesizes information systems and cognitive methods to systematically evaluate linguistic choices and digitally optimize user engagement. The customized IE assessment bot has practical applications for improving experience across contexts. Contributions include the novel IE framework, engagement forecasting techniques, and computational instruments for replicable text optimization.

# Target journal

**ISR —** [**Special**](https://pubsonline.informs.org/page/isre/calls-for-papers) **Issue on Analytical Creativity**

# Abstract

The study investigates the role of computational linguistics in enhancing user engagement with written text. By analysing the impact of words on engagement, we aim to create an AI agent capable of generating creative content. The research focuses on predictive and prescriptive modelling, with the ultimate goal of improving creativity and effectiveness in digital communication.

* Brief overview of the importance of information engagement (IE) in digital content.
* Introduction to the research objective: improving IE using computational linguistics to predict and modify text for increased user engagement.
* Summary of methods: literature review, data collection, and three studies (exploratory, predictive, and prescriptive).
* Key findings: Identification of engaging words, development of the READ model, and effectiveness of the DIMA model in improving IE.
* Contributions to the fields of information systems, computational linguistics, and user experience design.
* With increasing amounts of digital information being published by government, business, organizations, and individuals, understanding how digital information can be presented to improve user experience (UX) has gained increasing importance. Information engagement (IE) is an especially important aspect of UX reflecting behavioral, emotional, and cognitive responses to digital information\*.\* While the significance of IE has been well documented, little research has investigated how to systematically measure it; design for it; and, most importantly, improve it.
* This dissertation work developed and empirically validated a novel framework for assessment, prediction, and manipulation of IE based on the phrasing of the information itself. The objectives were to a) conceptually and operationally define IE; b) identify textual features of engaging information; and c) develop a method and instrument for systematic prediction and manipulation of IE using computational linguistics, text analysis, and natural language processing. These objectives were fulfilled within three research phases. In Phase 1, a conceptual model of IE dimensions and determinants was developed through a comprehensive interdisciplinary literature synthesis and empirically validated using large-scale user surveys. In Phase 2, a set of engaging textual attributes were identified to inform development of a method and instrument for the assessment and manipulation of IE using computational linguistics. In Phase 3, the IE model, method, and instrument were empirically tested to confirm that they improved IE with textual information.
* This research into the importance of word choice on UX contributes to the literature in several respects. Its identification of quantitative textual attributes that can be used to measure and predict engaging words and then applying them to construct and validate a systematic and automatic method for assessment and improvement of IE contributes an important tool and methods for immediate evaluation of IE and for further research into how to improve it. Their further application to diverse domains may identify ways to greatly improve IE, and therefore UX, with various media.

**Enhancing User Engagement through Computational Linguistics: A Study on Creative Content Generation**

# Introduction

## Background

*Information* is the meaning of data (Zins, 2007). [[1]](#endnote-1)The key characteristic of information is that it is subject to interpretation and processing. Data is being processed into information and then interpreted into knowledge (Frické, 2009). In written or digital text, each symbol, letter, word, phrase and so on convey information. The data available at one level is processed into information to be interpreted at the next level, until the information at the top level is interpreted and becomes knowledge. Information, therefore, is not knowledge itself, but rather the representation of it.

*Communication* is the exchange of information, or the act of conveying meaning. Providing information in the best form and format is critical to the success of information systems (IS) (Delone & McLean, 2003). Traditionally, IS research has been focused on the efficiency and effectiveness of information delivery and design. However, current research has been increasingly concentrated on the importance of *user experience* (UX), which encompasses all aspects of the end-user's interactions with a company, its services, and its products (Venkatesh & Bala, 2008; ISO 9241, 2019). In recent years, the term *engagement* has been increasingly used to describe and measure the quality and depth of UX (H. L. O’Brien et al., 2020). Referring to the emotional, cognitive, and behavioral connection between a user and a technological resource at a point in time and possibly over time (Attfield et al., 2011; H. L. O’Brien & Cairns, 2016), engagement emphasizes the positive aspects of interacting with a system and, in particular, the desire to use it longer and repeatedly (Lalmas et al., 2014).

This study focuses on assessment and improvement of *Information Engagement* (IE), defined as a measure of how users interact with information, and how it is expressed by the system. Long identified as a goal of organizational communication and a critical driver of successful information interactions, IE reflects the quality of the connection between users and the information and can affect the overall customer experience both online and offline(Akdeniz et al., 2013; Brodie et al., 2013; Mollen & Wilson, 2010; Singh et al., 2010).

Of the various means by which information can be communicated, this research focuses on IE with digital text. The study is motivated by current changes to the delivery and design of digital text, and the problems that arise when it is not engaging. Increasing reliance on computer-mediated communication (CMC) and information and communication technologies (ICT) has transformed how digital information is expressed, experienced, exchanged, and employed. Currently (in 2022) the majority of the information distributed digitally continues to be in the form of text (Johnston & Taylor, 2018). Recent studies have found that 93% of adults in the United States have consumed textual information online, either via a mobile device or a computer (Stocking, 2017); 79% have made an online purchase, spending nearly $350 billion annually as a nation (Smith, 2017); 80% of have accessed at least one online government service (Chan & Pan, 2008; Grimmelikhuijsen et al., 2013; Im et al., 2013); and 71% have searched online for health information (Imlawi, 2017; Kostkova, 2016; Perski et al., 2017; Rock Health, 2015).

With increasing amounts of digital information being published by commercial businesses, governments, healthcare organizations, and private citizens, the competition for attention and interest is constantly growing. With increasing theoretical and empirical evidence of its positive impact on education, government, and business (Arapakis, Lalmas, Cambazoglu, et al., 2014; R. Jacques et al., 1995; Oh & Sundar, 2016), IE is considered a significant factor in information delivery. Initiating, sustaining, and improving engagement can result in positive outcomes for citizen inquiry and participation, e-health, web searching, and e-learning (Huang et al., 2019; H. L. O’Brien & Cairns, 2016). It has become a goal—and to some extent, a necessity—of user interactions in various information-rich contexts and domains, including government, education, marketing, and healthcare (Feng & Ots, 2015; Frick, 2010; Huang et al., 2019; Lagun & Lalmas, 2016; Lalmas et al., 2014). Alternatively, failure to create IE often leads to lack of attention, involvement, and investment, and is associated with diminished productivity and poor decision-making (H. L. O’Brien et al., 2020; H. L. O’Brien & Cairns, 2016)(Chen et al., 2009; Lagun & Lalmas, 2016; Soto-Acosta et al., 2014). Despite the significance of IE, many organizations fail to achieve it, resulting in their online information being barely read and quickly forgotten (Arapakis et al., 2017; Nielsen, 2015; Szabo & Huberman, 2008).

In terms of design, IE has been proposed as a useful metric for assessing information quality and, by extension, the effectiveness of the information-management strategies of organizations (Bardus et al., 2016; Eppler, 2006; Jiang et al., 2016). In accordance, the Advertising Research Foundation (ARF) affirmed that engagement is “the 21st century metric of marketing communication’s efficiency and effectiveness," representing anything that can stimulate the level of viewers’ attention and emotion (Plummer et al., 2006). As information quality is a critical factor in information system success, developing a means of its assessment is essential (DeLone & McLean, 1992, 2003).

Recent developments in computational linguistics and natural language processing (NLP) have created opportunities to explore systematic, computational, and automatic approaches to the evaluation, creation, and improvement of digital text (Dvir & Gafni, 2019). While designing for engaging experiences is an oft-cited goal of interactive-system developers in many disciplines, they have few guidelines for creating engaging information (M. A. Blythe et al., 2005; Overbeeke et al., 2003). Moreover, little research is focused on the development of IE, resulting in a lack of systematic and computational approaches for its initiation, sustainment, and improvement of IE (H. L. O’Brien, 2017; H. L. O’Brien & Cairns, 2016).

Resolving these problems requires deep understanding of the IE process; the factors that influence it; and how it can be predicted and developed strategically, systematically, and computationally (Lalmas et al., 2014; H. L. O’Brien & Cairns, 2016).

## Analytical Creativity

**Reimagining Creativity in the Age of AI**

* Defining Creativity: Traditionally seen as the ability to produce new and valuable ideas, this notion is evolving with AI advancements like GPT-4.
* Analytical Creativity: This approach treats creativity as a replicable search problem, stripping away the 'mystique' to foster a systematic understanding of how creative results are achieved.
* Computational vs. Analytical Creativity: Computational creativity employs computers to mimic or amplify human creativity. In contrast, analytical creativity works to dissect and refine the creative process, bridging human intuition and algorithmic precision.

**Objective:** To broaden the understanding of creativity beyond traditional boundaries, fostering collaboration between human ingenuity and algorithmic innovation.

* **Defining Creativity**: Creativity involves generating new and valuable outputs, a definition challenged and expanded by advancements in generative models like GPT-4.
* **Four C Model of Creativity**: Kaufman and Beghetto’s model categorizes creativity into mini-c (transformative learning), little-c (everyday creativity), Pro-c (professional expertise), and Big-C (eminent contributions).
* **Analytical Creativity**: Posed as a replicable search problem, analytical creativity aims to demystify the process behind creative outcomes, emphasizing a methodical approach over the 'magical' aspect of traditional creativity views.
* **Computational vs. Analytical Creativity**: While computational creativity focuses on using computers to emulate or enhance creativity, analytical creativity seeks to understand and optimize the creative process across human and machine domains.
* **Research Scope**: Encourages multidisciplinary research integrating fields like information systems, neuroscience, and computer science, focusing on topics like the evolving definitions of creativity, accountability in computer-generated creativity, and the role of neuroscience in understanding creativity.
* **Key Topics**: Includes changing definitions of creativity, accountability in algorithm-designed products, creativity as a search problem, human-algorithm collaboration, and the potential for neuroscientific approaches to deepen understanding of creativity.

Key Discussions:

Evolving concepts of creativity in the digital era.

Responsibility in AI-generated creations.

Viewing creativity as a methodical search problem.

Synergizing human creativity with algorithmic aid.

Exploring neuroscientific insights to unlock the secrets of creative cognition.

Creativity can be defined through several key characteristics:

* **Novelty**: The ability to produce original ideas, concepts, or solutions that have not been thought of before.
* **Value**: The capacity to generate ideas or outcomes that are useful, effective, or have significance to individuals, groups, or society at large.
* **Divergent Thinking**: The capability to think in varied and unique directions to explore multiple possible solutions to a given problem.
* **Innovation**: Applying creative thoughts to produce something new or improve existing methods, products, or services.
* **Problem-Solving**: Utilizing creative processes to find solutions to complex, ambiguous, or challenging problems.
* **Cross-Disciplinary Application**: The ability to apply ideas or principles from one domain to another in innovative ways.
* **Flexibility**: The capacity to adapt, change perspective, and see with fresh eyes, often leading to breakthrough ideas.
* **Risk-Taking**: The willingness to take chances and try new things, even at the risk of failure, as a pathway to discovery and innovation.

## IT’S NOT WHAT YOU SAY, IT’S HOW YOU SAY IT

The proliferation of digital information has underscored the importance of effective presentation strategies to enhance user experience (UX). Specifically, *information engagement* (IE), encompassing behavioral, emotional, and cognitive responses to digital content, plays a pivotal role. While the significance of IE is well-documented, there remains a dearth of research on systematic measurement, design, and improvement strategies.

This research project leverages computational linguistics to enhance creativity and user engagement with written text. The emergence of generative models like GPT-4 has sparked renewed interest in creativity. While human creativity remains a black box, algorithmic creativity is equally mysterious. This study focuses on analytical creativity, aiming to unravel its mechanisms and enhance creative outputs. The proliferation of digital information necessitates effective presentation strategies for enhancing user experience (UX). Analytical creativity, especially in the context of computational linguistics, holds immense promise. Our goal is to create an AI agent capable of generating creative content by predicting and prescribing engaging text. For instance, given Sentence A and Sentence B, the system would discern which one resonates more with users. Text significantly influences behavior and interactions, and our aim is to mathematically predict and optimize this effect.

While IE is significant, little research has examined how to measure or improve it. This paper addresses that gap by utilizing computational linguistics and cognitive psychology. Specifically, we:

1. Conceptually define IE and identify key dimensions of perception, participation, and perseverance based on an interdisciplinary literature review.
2. Develop a predictive model (the READ model) that uses textual attributes like representativeness, ease of use, affect, and distribution to forecast word engagement levels.
3. Create a prescriptive model that employs natural language processing to automatically replace words with more engaging synonyms.

We conduct three main studies: an exploratory analysis of how phrasing impacts IE; creation and validation of the READ predictive model; and randomized trials demonstrating the prescriptive model's ability to enhance IE dimensions.

Overall, this analytical creativity research synthesizes information systems and cognitive methods to systematically evaluate linguistic choices and digitally optimize user engagement. The customized IE assessment bot has practical applications for improving experience across contexts. Contributions include the novel IE framework, engagement forecasting techniques, and computational instruments for replicable text optimization.

The study’s objectives are as follows:

1. **Literature Review**: Conduct an extensive review to identify the independent variable (text) and dependent variable (user engagement). This includes exploring relevant predictors and measurement techniques.
2. **Data Collection on Word Influence**: Gather data specifically focused on how individual words impact engagement.
3. **Three Studies**:
   * **Exploratory Study**: Observe and predict user engagement patterns with diverse text samples.
   * **Predictive Model**: Develop an algorithm that identifies engaging words.
   * **Prescriptive Model**: Modify text to enhance engagement.

The results of this research endeavor aim to empower writers by computationally optimizing word choice, thereby enhancing creativity and writing effectiveness. The literature review will underscore the pressing need to address the challenge of fully engaging readers in written content.

* Integrate the definition of creativity provided by the call for papers, emphasizing its relevance to the study's focus on using computational linguistics to enhance user engagement with digital information.
* Discuss the backdrop of rapid advances in generative models, like GPT-4, as a motivation for the research, aligning with the special issue's interest in the boundaries of human and machine creativity.

Recent advances in generative AI models for creative tasks have sparked scholarly interest in creativity, especially a form called analytical creativity (Kaufman and Beghetto, 2009). As defined by Abraham (2018), analytical creativity conceptualizes creative tasks as search problems to find optimal and valuable outcomes. Evidence from neuroscience and deep learning research indicates that human creativity may follow systematic steps that can be codified into algorithms (Eisenstein, 2021; Riedl et al., 2020).

## Information Engagement (IE)

* Defined as behavioral, emotional, and cognitive responses to digital content. Contextualize the importance of digital information and the user experience (UX).
* Outline the paper's structure.

## Research Gap

Despite the significance of IE, systematic measurement and design approaches remain underexplored. Define the problem: the need for improved information engagement (IE) in digital content.

## Objective

To leverage computational linguistics for creativity enhancement and user engagement. to use computational linguistics for enhancing creativity and engagement in written text.

Define, predict, and manipulate information engagement (IE)

Here is an edited version of the description:

This research paper develops and validates a framework for systematically assessing, predicting, and enhancing information engagement (IE) in digital platforms. IE refers to how users interact with and respond to digital information and is an important aspect of user experience.

While IE is significant, little research has examined how to measure or improve it. This paper addresses that gap by utilizing computational linguistics and cognitive psychology. Specifically, we:

1) Conceptually define IE and identify key dimensions of perception, participation, and perseverance based on an interdisciplinary literature review.

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Overall, this analytical creativity research synthesizes information systems and cognitive methods to systematically evaluate linguistic choices and digitally optimize user engagement. The customized IE assessment bot has practical applications for improving experience across contexts. Contributions include the novel IE framework, engagement forecasting techniques, and computational instruments for replicable text optimization.

## Overview of approach:

Computational linguistics to systematically assess and enhance IE

Outline how the research methodology aligns with the call for multi-disciplinary studies integrating fields like information systems, computer science, and neuroscience, addressing the call for both empirical and design-science contributions.

* Study 1: Explore IE with words dataset
* Study 2: Predictive model relating READ features to IE
* Study 3: Prescriptively improve IE through NLP optimization
* Outline how the research methodology aligns with the call for multi-disciplinary studies integrating fields like information systems, computer science, and neuroscience, addressing the call for both empirical and design-science contributions.

**Reimagining Creativity in the Age of AI**

* Defining Creativity: Traditionally seen as the ability to produce new and valuable ideas, this notion is evolving with AI advancements like GPT-4.
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# Objective: To broaden the understanding of creativity beyond traditional boundaries, fostering collaboration between human ingenuity and algorithmic innovation

# “IT’S NOT WHAT YOU SAY, IT’S HOW YOU SAY IT”

Enhancing User Engagement Through Wording: A Comprehensive Research Approach

**Phases:**

* **Exploratory:** Examining the relationship between words/phrasing (independent variable) and user engagement (dependent variable).
* **Descriptive:** Understanding information engagement (IE) and the impact of phrasing.
  + **Objective:** Investigate how wording affects user experience, measured by engagement levels.
* **Predictive:** Developing a model to predict engaging phrases using textual and linguistic features using computational linguistics and NLP
* **Prescriptive:** Applying the model to systematically, computationally and automatically improve digital text engagement
* **Innovating with AI:** Build a custom GPT to automatically analyze and refine text, ensuring it is compelling and engaging for the audience.
* Providing information in way that maximizes effectiveness critical to information systems (IS) success
* Information is the meaning that users assign to data
* While traditionally the focus has been on usability measures, current research has been increasingly focused on user experience (UX)
* In recent years, the term “engagement” has been gradually used to describe and measure the quality and depth of UX
* This work investigates the concept of engagement with information, or “information engagement” (IE)
* Information Engagement (IE), defined as a measure of how users interact with information, and how it is expressed by the system
* This work focuses on **textual information, specifically words.**
* **WHY TEXT?**
* Controllable
* Computational linguistics and natural language processing
* Most of the information published fails to engage resulting in it being barely noticed or quickly forgotten
* **The overarching objective of this work is to develop a framework for modeling, measuring and manipulating IE.**
* **Specifically, it investigates how the expression of the information, i.e., the phrasing or wording used in its communication (independent variable) impacts IE (dependent variable)**
* **OBJECTIVES**
* Conceptually and operationally define IE by identifying its distinctive dimensions and determinants
* Recognize predictors of engaging information and use them for quantitative feature selection and development of a predictive model and metrics
* Create and test an instrument to assess and manipulate IE systematically and computationally using computational linguistics, text analysis and natural language processing
* **RESEARCH QUESTIONS**
* What is the relationship between information expression and IE?
* *(What defines IE and how does phrasing influence it?)*
* How can IE be predicted systematically and computationally?
* *(Can textual predictive features enhance engagement?)*
* How can IE be prescribed (manipulated) systematically and computationally using computational linguistics and natural language processing?
* *(How can we computationally enhance text engagement using these insights?)*
* **Outcome:** A strategic framework for elevating digital content engagement through informed text optimization.

Here is an edited introduction section incorporating the key points from the description:

With the proliferation of digital content, effectively presenting information to enhance user experience (UX) has become imperative. A critical dimension of UX is information engagement (IE), encompassing behavioral, emotional, and cognitive responses to digital information. While the value of IE is well-established, strategies for systematic measurement and improvement remain limited.

This paper develops an analytical creativity approach utilizing computational linguistics to evaluate and optimize IE with textual content. Specifically, we:

1) Conceptually define IE and its key facets of perception, participation, and perseverance based on an interdisciplinary literature review

2) Construct a predictive model called the READ framework that leverages dimensions like representativeness and affect to forecast word-level engagement

3) Design a prescriptive system using NLP to automatically substitute more engaging synonym alternatives

Our methodology includes three core studies: a) exploring how phrasing drives IE; b) validating the READ predictive model; and c) demonstrating the prescriptive model's ability to significantly enhance IE.

This research synthesizes information systems and cognitive psychology techniques to digitally assess linguistic choices and maximize user engagement. Practical applications like our customized IE bot can improve UX across domains. We contribute an original IE assessment framework, computational forecasting methods, and replicable text optimization tools. Ultimately, systematically evaluating and designing for IE promises to transform digital experiences and interactions.

# Literature Review

The first phase of this research will explore how the expression of the information by the system, specifically its phrasing, impact engagement

A comprehensive, interdisciplinary literature review will be conducted to understand how engagement with information, or information engagement (IE) is defined, how is it manifested (what are its dimensions) and what are its determinants

A measurement model will be developed.

Altshuller’s (1984) theory of inventive problem solving (TRIZ) and Ding’s (2020) logical creativity theory exemplify analytical creativity research seeking to uncover replicable creative processes. The goal is to develop methods that can enhance creativity without requiring innate ability (Kaufman and Beghetto's, 2009 "mini-c" level).

## Information engagement (IE)

Engagement is critical to the success of learning activities such as writing, and can be promoted with appropriate feedback {Citation}(Liu et al., 2015) . Current engagement measures rely mostly on data collected by observers or self-reported by the participants.

* Defining information engagement and its components.
* Definition and key dimensions (perception, participation, perseverance)
* Define information engagement and its significance in UX.

## Determinants from prior research

## ****Existing Research****:

* Reviewing studies on IE, predictors, and measurements.
* **Gap Identification**: Highlighting the need for systematic approaches to improve IE.

## Theoretical foundations

### User Engagement theory

### Cumulative Prospect Theory (CPT).

Cumulative Prospect Theory and cognitive biases/heuristics

## Gap Identification

* Highlight the novelty of using computational linguistics to address IE.
* Highlighting the need for systematic approaches to improve IE.

# Theoretical Framework

* **Independent Variable (Text)**: Discussing the role of textual content in influencing engagement.
* **Dependent Variable (User Engagement)**: Defining engagement and its dimensions.
* **Predictors and Measurements**: Exploring linguistic features and models related to IE.

Conceptual Framework and Hypotheses

* READ model dimensions (representativeness, ease of use, affect, distribution)
* Predict IE based on textual features
* Manipulate IE through computational synonym replacement

# Methodology

* **Data Collection**: Describing the process of collecting engagement data from text.
* **Corpus Selection**: Justifying the choice of text corpus for analysis.
* **Word-Level Analysis**: Detailing the approach to studying word impact on engagement.
* Study 1: Explore IE with words dataset
* Study 2: Predictive model relating READ features to IE
* Study 3: Prescriptively improve IE through NLP optimization
* Outline how the research methodology aligns with the call for multi-disciplinary studies integrating fields like information systems, computer science, and neuroscience, addressing the call for both empirical and design-science contributions.

# Study 1: Exploratory Analysis

* Exploratory Study

## ****Objective****:

* A measurement model will be developed. The model illustrates how IE is manifested, how it differs from other forms of engagement and how it is driven and fostered by the information itself. Mainly, the model will suggest that IE is determined by the information itself, and not the technology used
* Observing user engagement patterns with diverse text samples.

## ****Methods****:

* The model will be empirically validated in a large-scale user study. Participants will be presented with variations of words, and IE with them will be measured and compared through the various dimensions recognized. The objectives of the study, therefore, are to validate that IE manifests through participation, perception and perseverance, and that it is determined by the information itself
* Randomized controlled trials comparing synonyms' impact on IE dimensions.
* Using Qualtrics, metadata were collected on the technology used by the participants to complete the surveys.
* The purpose of study 1 is to measure word engagement unrelated to context. Therefore, the words are presented separately and the UES has been modified slightly to relate to standalone words. This will allow us to compare engagement between word variants (different words with the same meaning) as well as provide a foundation for the following study, in which machine learning will be used to predict which word variant is more engaging
* The purpose of study 1 is to measure word engagement unrelated to context. Therefore, the words are presented separately and the UES has been modified slightly to relate to standalone words. This will allow us to compare engagement between word variants (different words with the same meaning) as well as provide a foundation for the following study, in which machine learning will be used to predict which word variant is more engaging

## **Results**

* Words have significant IE variation
* Identifying trends and patterns related to engaging text.
* Dataset creation of words rated on perception, participation, and perseverance.
* Participants will be recruited using emails sent to a listserv of undergraduate students in a large research university in the U.S. After completing the online survey, participants will also be asked to forward
* invitations to other participants from among their acquaintances (a technique called “snowball sampling”).
* Qualtric.com : http://bit.ly/sw3lsp21
* informed consent (see section 7.2). Following, they will be asked to provide some demographic information (see section 7.3). Technology data (which system the users are using) will also be recorded (details are in section 7.3). Then, users will be randomly presented with information in the form of words (see section 7.4 for a word list). IE will be measured through participation (users will be asked to choose the words from a list), perception (using the UES and other questions relating to attitude) and perseverance (their recall and recognition of the words shown)
* In addition to IE with words, a post-task questionnaire will measure users’ IE with the survey as a whole through their evaluation of the experience using the UES
* Qualtric.com : http://bit.ly/sw3lsp21
* informed consent (see section 7.2). Following, they will be asked to provide some demographic information (see section 7.3). Technology data (which system the users are using) will also be recorded (details are in section 7.3). Then, users will be randomly presented with information in the form of words (see section 7.4 for a word list). IE will be measured through participation (users will be asked to choose the words from a list), perception (using the UES and other questions relating to attitude) and perseverance (their recall and recognition of the words shown)
* In addition to IE with words, a post-task questionnaire will measure users’ IE with the survey as a whole through their evaluation of the experience using the UES

# . Study 2: Predictive Model Development

* **Predictive Model**

## **Objective**:

* Developing a model that predicts engagement based on word features.
* Introduction to the READ model: Representativeness, Ease of use, Affect, and Distribution.

## Methodology

* Computational analysis of word features to predict IE.
* **Features**: Sentiment, readability, novelty, etc.
* **Machine Learning Approach**: Specify the algorithm used.

## ****Results****

Development and validation of a predictive model with high accuracy.

READ model predicts IE effectively

$$ P(Y = 1 | X) = \frac{1}{1 + e^{-(-2.0611 - 0.0375X\_{\text{DefinitionsSynsets}} - 0.1023X\_{\text{Hypernyms}} + 0.0184X\_{\text{Hyponyms}} + 0.1312X\_{\text{PosMax}} - 0.0686X\_{\text{NegMax}} - 0.0700X\_{\text{Syllables}} - 0.0410X\_{\text{Length}} - 0.2195X\_{\text{Frequency}} + 0.5569X\_{\text{wnzipf}})}} $$

*P*(*Y*=1∣*X*)=1+*e*−(−2.0611−0.0375*X*DefinitionsSynsets​−0.1023*X*Hypernyms​+0.0184*X*Hyponyms​+0.1312*X*PosMax​−0.0686*X*NegMax​−0.0700*X*Syllables​−0.0410*X*Length​−0.2195*X*Frequency​+0.5569*X*wnzipf​)1​

# Study 3: Prescriptive Model Testing

* ***Prescriptive Model***

## ****Objective****s

* To modify text using the predictive model to improve IE.
* Modifying text to enhance engagement.

## Method:

* **Strategies**: Paraphrasing, word replacement, restructuring.
* **Evaluation**: Assessing modified text effectiveness.
* Application of NLP and AI to replace less engaging synonyms in digital content.

## Results:

Significant improvements in IE dimensions across modified text examples.

Computational optimization enhances IE

# Discussion

* Interpretation of findings within the context of information systems and computational linguistics.
* Our framework contributes an analytical creativity approach and instrument for assessing and improving engagement - addressing calls for AI accountability and human-machine collaboration (Special Issue CfP).

## Theoretical implications:

* Contribution to understanding how cognitive biases influence IE.
* Reflect on how the research findings contribute to the special issue's themes, such as redefining creativity, understanding creativity as a search problem, and exploring human-algorithm collaboration in creative tasks.
* Discuss how the predictive and prescriptive models developed in the study contribute to the analytical creativity literature by providing a systematic approach to enhancing user engagement with text.
* Highlight the practical implications of the research in terms of developing a customized ChatGPT tool, aligning with the special issue's interest in applications that enhance human creativity or achieve human-level creativity through algorithms.

## Practical implications:

* Development of a custom ChatGPT tool for enhancing text engagement.
* Discussing implications for creativity enhancement.
* Summarizing contributions to computational linguistics and UX.
* Words have significant IE variation
* READ model predicts IE effectively
* Computational optimization enhances IE
* Key findings and implications
* Contributions to theory and practice
* Limitations and future research

**. Limitations and Future Research**

* Acknowledge the study's limitations, including potential biases and generalizability issues.
* Suggest avenues for future research, particularly in other domains of digital content.
* Proposing AI agents for creative content generation.
* NeuroIS techniques could provide further insight into underlying cognitive mechanisms (Dimoka et al., 2011). Extending the model to organizational or social domains represents another promising direction, as analytical creativity research has focused more on individual tasks.

# Conclusion

* this analytical creativity research synthesized cognitive psychology and IS methods to systematically evaluate and enhance linguistic choices. The model epitomizes creativity as an efficient search process rather than divine inspiration. Practical tools like our IE assessment bot enable replicable and ethical improvements in UX across contexts.
* Recap the study's objectives, methods, and key findings.
* Emphasize the importance of this research in improving digital user experience through better word choice.
* Highlight the contribution to analytical creativity in information systems.
* Importance of linguistic choices on user engagement
* Framework to systematically evaluate and enhance IE
* Reiterate the significance of the study's contributions to the themes and questions raised in the ISR Special Issue on Analytical Creativity.
* Reflect on the potential of computational linguistics and AI to redefine the boundaries of creativity, as discussed in the call for papers, emphasizing the study's role in advancing analytical creativity.

# References

* **Quantitative Findings**: Presenting results from exploratory study and predictive model.
* **Qualitative Insights**: Incorporating user feedback and observations.
* **Implications**: Discussing implications for creativity enhancement.

# Appendices (if applicable)

* Supplementary materials, including detailed descriptions of computational methods, datasets, and additional analyses.

# 7. Conclusion

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# Method

## Heading Level 2

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***Heading Level 5.*** Phasellus efficitur mi ligula, ac pretium nulla maximus et. Duis imperdiet varius eros eget lacinia. Sed laoreet commodo ex eget vestibulum.

# Results

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# Discussion

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**Table 1**

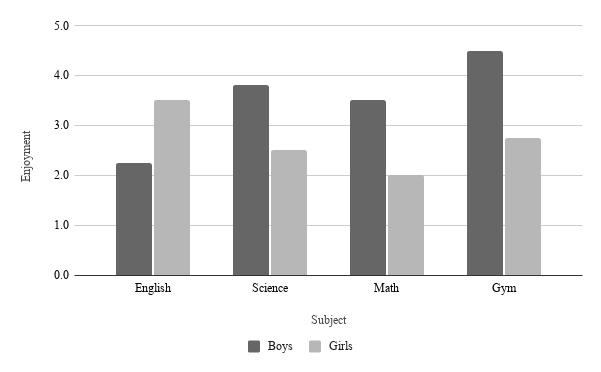
*Table Title*

|  |  |  |  |
| --- | --- | --- | --- |
| College | New students | Graduating students | Change |
| Cedar University | 110 | 103 | +7 |
| Elm College | 223 | 214 | +9 |
| Maple Academy | 197 | 120 | +77 |
| Pine College | 134 | 121 | +13 |
| Oak Institute | 202 | 210 | -8 |
| Total | 866 | 768 | 98 |

*Note.* Adapted from *Book Example*, by A. Author, 2020, p. 100. Copyright 2020 by Scribbr.

**Figure 1**

*Figure Title*

**

*Note.* Number of boys = 30, number of girls = 31, total *N* = 61.

1. asdsadsdas [↑](#endnote-ref-1)