Turns Over Plot Twists: The Use of Butterfly-Effect Model for Causal-Driven Story Development Program for Grade 5

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Abstract

This action research aimed to investigate the effectiveness of the Butterfly-Effect Model as a pedagogical framework for developing causal-driven story writing skills among Grade 5 students at Don Bosco Technical Institute of Makati. Employing a one-group pretest-posttest design within a mixed-methods approach, the study implemented a structured program over four weeks. Quantitative data from 71.42 (Fair) to 86.37 (Very Satisfactory), with a mean gain of 14.95 points. Analysis of writing components revealed the most significant improvement in Plot Sequence (mean gain of 17.70), followed by Structure & Organization, Cultural Relevance, and Figures of Speech. Qualitative data from student interviews identified initial challenges in applying the causal model but overall positive perceptions of its utility for planning and avoiding arbitrary plot twists. Based on the findings, a Performance Task Action Plan was developed to provide educators with a structured, culturally relevant framework for sustained instruction in narrative causality. The study concludes that the Butterfly-Effect Model is an effective tool for enhancing narrative coherence, plot development, and students' metacognitive awareness in story writing.

Keywords*: Butterfly-Effect Model, causal-driven narrative, story writing, Grade 5, action research, performance task*

INTRODUCTION

Recent work indicates that causal relationships are fundamental to narrative coherence. A narrative evaluation revealed that building causal relationships in narratives significantly enhances readers' comprehension and retention of texts; research gaps suggest that several learners inadequately use these connections (Buralli and Cevasco, 2023). Research on elaboration and recall tests indicates that sentences with significant causal connectedness are more frequently included in free recall, suggesting enhanced cognitive integration of these narrative structures (Ammaturo & Cevasco, 2023). Moreover, in L2 situations, longitudinal studies demonstrate that discourse organization, encompassing event sequencing and causal flow, enhances over time with focused practice (Lu and Pan, 2024). Research conducted in the Philippines on Grade 5 learners utilizing the Story Grammar Strategy indicates that instructing students to

identify narrative structure (setting, events, resolution, etc.) resulted in improvements in reading comprehension and narrative understanding, implying that a coherent narrative structure enhances both reading and writing abilities (Comon, Labadan, & Mendoza, 2025).

The Butterfly-Effect Model, derived from chaos theory, asserts that small starting occurrences can result in significant outcomes. This paradigm in narrative writing assists students in tracing how an event ("butterfly flap") initiates following occurrences and influences the storyline. Implementing this paradigm may assist in guiding pupils from fragmented plot twists to narratives that are causally consistent and cohesive.

This action study, entitled "Turns over Plot Twists: The Use of Butterfly-Effect Model for Causal-Driven Story Development in Grade 5," aims to tackle the challenges faced by Grade 5 students in narrative writing. Aside from this, the study examines the efficacy of the Butterfly-Effect Model as an educational technique to assist learners in composing causally driven narratives that maintain a balance between originality and coherence.

The results of this research were advantageous for both students and educators. The curriculum improved students' capacity to compose coherent and causally linked narratives, thereby enhancing their general literacy, creativity, and critical thinking abilities. It also enabled students to see how minor aspects in a narrative may affect broader consequences, cultivating a greater appreciation for storytelling. The study provided educators with an innovative instructional framework incorporated into language and literature education. It offered a pragmatic approach to tackle prevalent issues in narrative composition, like insufficient coherence and dependence on arbitrary plot twists, while also fostering creativity in the classroom.

This research examined the incorporation of the Butterfly-Effect Model in narrative composition among Grade 5 students at Don Bosco Technical Institute of Makati throughout the first term of the school year 2025–2026. This was incorporated in their Performance Task. The focus was restricted to narrative writing assignments, specifically short stories, in which students were instructed to outline causal sequences of events. Expository and persuasive passages were excluded. The intervention was executed over [number of weeks] through two cycles of action research, encompassing planning, execution, observation, and reflection. This study derived its findings from classroom outputs, instructor observations, and student comments. The findings offered insights for improving narrative writing abilities but may not be entirely applicable to different grade levels, situations, or writing genres.

In terms of the Statement of the Problem, this action research, entitled "Turns over Plot Twists: The Use of Butterfly-Effect Model for Causal-Driven Story Development Program for Grade 5," aimed to determine the effectiveness of the Butterfly-Effect Model in improving the story writing skills of Grade 5 learners. Specifically, it sought to answer the following questions:

1. What is the level of students' story writing performance before and after implementing the Butterfly-Effect Story Development Program, as measured by their pretest and post-test scores?
   a. Plot Sequence (Exposition, Rising Action, Climax, Falling Action, Resolution);
   b. Structure and Organization (Butterfly Effect Model);
   c. Cultural and Holiday Relevance (Philippine National Holiday); and
   d. Use of Figures of Speech (Clarity and Meaning, and Sound Devices)?
2. What problems did the students encounter while engaging in story writing using the Butterfly-Effect Model?

3. How did the students describe the helpfulness of the Butterfly-Effect Model in developing their story writing skills?
4. What improvement can be observed in students' overall story writing performance after the implementation of the program?
5. What Performance Task Action Plan can be developed based on the findings of the study to further strengthen causal-driven story writing instruction?

Literature Review

The narrative writing proficiency of primary students is often assessed by pretest–posttest methodologies to measure the efficacy of instructional interventions. Recent studies indicate that specific training in narrative structure and guided writing practice yield quantifiable enhancements in students' story writing skills. Pacheco-Costa and Guzmán-Simón (2020) discovered that organized narrative training markedly enhanced learners' capacity to arrange events and sustain coherence in written narratives. Longitudinal research by Kim and Graham (2021) indicated that students who underwent systematic writing training achieved superior post-test scores in narrative quality compared to those who utilized conventional free-writing methods.

The plot sequence—consisting of exposition, rising action, climax, falling action, and resolution—is a fundamental component of narrative writing pedagogy. Studies demonstrate that students who intentionally study plot structure create tales with enhanced development and greater coherence. Graham et al. (2020) assert that direct instruction in narrative grammar aids learners in comprehending the logical sequencing and causal relationships of events. In classroom research, Fitriani (2022) found that students instructed on plot elements directly exhibited more coherent tale development and less abrupt changes in their writing.

The structure and organization of a story are essential determinants of narrative quality. The Butterfly-Effect Model, which highlights the relationship between minor actions and substantial consequences, has been suggested as a conceptual framework for instructing causality in narrative. Initially grounded in systems and chaos theory, its pedagogical application challenges students to delineate sequences of events and their repercussions (Sweeney & Sterman, 2021). Research indicates that causal mapping tools enhance students' skills in planning and organizing narratives (van den Broek et al., 2021).

Culturally appropriate instruction significantly influences student involvement and academic performance. Integrating recognizable cultural settings, such as Philippine national holidays, into writing assignments enables learners to leverage past knowledge and real-life experiences. Ladson-Billings (2021) asserted that culturally relevant pedagogy improves comprehension and student engagement. In the context of the Philippines, Reyes and Domingo (2023) discovered that students produced more elaborate and significant tales when the prompts were culturally relevant.

Figures of speech enhance the expressiveness and intelligibility of tales when employed judiciously. Studies indicate that direct teaching of figurative language enhances students' capacity to express meaning and emotional resonance in writing (McCarthy & Goldman, 2021). Elementary learners frequently misapply figures of speech, leading to ambiguous or hyperbolic statements that undermine narrative coherence (Fitriani, 2022).

Notwithstanding the advantages of organized writing models, students frequently face challenges during their use. Prevalent obstacles encompass difficulties in delineating causal chains, excessive reliance on basic connections, and reluctance towards the planning phases (Cheung, 2023). Qualitative classroom research indicates that students first view structured models as constraining but eventually acknowledge their use via ongoing scaffolding and directed practice (Kim & Graham, 2021).

Students' perspectives offer significant insights into the efficacy of teaching methods. Research indicates that students who comprehend the objectives of writing models have heightened confidence and enhanced writing results (van den Broek et al., 2021). In mixed-methods research, student responses revealed that visual mapping tools enhanced their story planning and mitigated arbitrary plot deviations (Reyes & Domingo, 2023).

Improvements in narrative writing skill are most apparent when teaching incorporates structure, causality, cultural relevance, and linguistic elements. Graham et al. (2020) demonstrated that multi-component writing education yields greater improvements than standalone skill instruction. This facilitates the creation of comprehensive narrative development initiatives, exemplified by the Butterfly-Effect narrative Development Program.

Performance tasks are acknowledged as genuine evaluations that include learning and evaluation. The Philippine K–12 system promotes performance task action plans to enhance competency-based education (Department of Education, 2021). Formulating a Performance Task Action Plan grounded in research findings guarantees the intervention's durability and equips educators with a pragmatic instrument for classroom implementation.

METHODOLOGY

Research Design

This research utilized a one-group pretest-posttest experimental design inside an action research framework. This methodology was suitable for classroom study aimed at assessing the impact of an educational intervention on learners' performance before and after its adoption (Creswell & Creswell, 2021). The methodology enabled the researcher to assess variations in students' narrative writing skills after participation in the Butterfly-Effect Story Development Program, circumventing the necessity for a control group, a typical practice in educational action research settings (Mertler, 2020).

The study employed a mixed-methods technique to enhance the findings, integrating quantitative data from pretest and post-test scores with qualitative data from student interviews. The amalgamation of quantitative and qualitative data yielded a more thorough comprehension of learning outcomes and students' experiences during the intervention (Johnson et al., 2020).

Participants and Research Locale

The research participants were fifth-grade students from five sections during the first term of the 2025–2026 academic year at Don Bosco Technical Institute of Makati. All five sections engaged in the

intervention to guarantee uniformity in education and evaluation among groups. Participant selection utilized complete enumeration, including all pupils within the designated Grade 5 sections for the study.

Fifth-grade students were selected due to their anticipated advancement in narrative writing skills, encompassing plot creation, organization, and the application of literary techniques, in accordance with K–12 curricular requirements. Ethical issues were upheld, including alerting students of the study's objective and ensuring their responses were utilized only for academic research.

Research Instruments

a. Story Writing Test (Pretest and Post-test)

A researcher-created narrative composition assessment was conducted as both the pretest and post-test. The examination necessitated that students compose an original tale in response to a specified prompt. The identical scoring rubric was employed for both assessments to guarantee uniformity and comparability of outcomes.

The rubric evaluated the subsequent dimensions:

1. Plot Structure (exposition, rising action, climax, declining action, resolution);
2. Structure and Organization Utilizing the Butterfly-Effect Model;
3. Cultural and Holiday Significance (Philippine national holiday background);
4. Utilization of Figures of Speech (clarity, significance, and auditory devices).

Rubric-based assessment is acknowledged as an excellent instrument for evaluating writing performance due to its facilitation of analytic scoring and enhanced understanding of learning advancements (Graham et al., 2020).

b. Interview Questionnaire

A semi-structured interview questionnaire was created to collect qualitative data about students' perceptions of the Butterfly-Effect Model. The interview concentrated on:

● the utility of the paradigm in narrative composition, and
● the challenges or obstacles faced throughout the writing process.

Semi-structured interviews facilitated students' expression of their perspectives while maintaining alignment with the study topics (Braun & Clarke, 2021). Chosen students from each Grade 5 section engaged in interviews to provide diverse viewpoints.

Research Procedure

The research was carried out over four weeks, with two sessions each week, adhering to a systematic learning framework.

a. Pre-Implementation Stage

In the initial week, the researcher conducted a pretest to assess the baseline proficiency of students in narrative writing. The pretest results were evaluated utilizing the analytic rubric.

b. Execution Phase

The Butterfly-Effect Story Development Program was executed throughout the five Grade 5 sections during the subsequent four weeks. Each week had two educational sessions concentrating on:

- recognizing preliminary occurrences in a narrative,
- utilizing the Butterfly-Effect Model to delineate causal chains,
- including narrative structure, cultural significance, and figurative expression, and
- producing comprehensive narrative products.

The intervention adhered to the plan–act–observe–reflect cycle typical of action research, allowing ongoing modifications of instruction informed by classroom observations (Mertler, 2020).

c. Post-Implementation Stage

Upon conclusion of the intervention, the post-test was conducted utilizing the identical writing prompt style and rubric. Interviews were performed to get students' qualitative comments about the program's efficacy and the problems faced.

Data Analysis

The quantitative data from the pretest and post-test were studied by descriptive statistics, encompassing mean scores and score differentials, to assess enhancements in students' narrative writing skills. The pretest–posttest comparison is a widely employed technique in educational research for assessing instructional efficacy (Creswell & Creswell, 2021).

The qualitative data from the interviews were examined via thematic analysis, which entailed classifying student responses and identifying prevalent themes including helpfulness and challenges faced. Thematic analysis is appropriate for classroom research as it systematically reveals patterns in learners' experiences (Braun & Clarke, 2021).

Research Output

A Performance Task Action Plan was prepared based on the study's findings. The plan functions as a pragmatic instructional manual for educators, delineating objectives, learning activities, assessment standards, and exemplar performance assignments in accordance with the Butterfly-Effect Model. Creating an educational output grounded in research findings guarantees the durability and classroom relevance of the intervention (DepEd, 2021).

RESULTS

1. *Level of Students' Story Writing Performance Before and After the Implementation of the Program*

Table 1.

Mean Scores of Students' Story Writing Performance Before and After the Intervention

Test	Mean Score	Standard Deviation	Descriptive Interpretation
Pretest	71.42	6.18	Fair
Post-test	86.37	5.24	Very Satisfactory
Mean Gain	**14.95**	—	Improved

As stated in Table 1, the pretest and post-test outcomes demonstrated a significant enhancement in students' narrative writing abilities following the execution of the Butterfly-Effect Story Development Program. In summary, post-test results exhibited enhanced plot development, more robust causal relationships among events, superior organization, and a more proficient use of language relative to pretest narratives.

In the pretest, several students generated narratives that were predominantly cohesive yet depended on linear storytelling and implicit causal links. Although students successfully introduced characters and events, essential narrative components like climax and conclusion were either inadequately developed or abruptly resolved. Subsequent to the intervention, post-test narratives exhibited enhanced organization of events, more explicit causal relationships, and more intentional conclusions.

The findings align with research demonstrating that explicit teaching in narrative structure and causal reasoning results in significant improvements in students' writing ability (Graham et al., 2020; Kim & Graham, 2021).

2. *Performance by Story Writing Components*

Table 2.

Summary of Pretest–Post-test Improvements Across Writing Components

Writing Component	Pretest Mean	Post-test Mean	Mean Gain	Overall Interpretation

Plot Sequence	66.65	84.35	17.70	Highly Improved
Structure & Organization	14.05	18.25	4.20	Improved
Cultural Relevance	14.80	18.10	3.30	Improved
Figures of Speech	13.18	16.23	3.05	Improved

Based on the Table 2, the following were interpreted:

A. Plot Sequence (Exposition, Rising Action, Climax, Falling Action, Resolution)

Evaluation of student outputs shown considerable enhancement in plot sequencing. In the pretest, narrative phases were frequently evident but not distinctly delineated. Events were often condensed into a single paragraph or given without adequate development.

For instance, Student #8's pretest presented the conflict (Jesi's aversion to Christmas) and resolution (acceptance by Bob's family) but was deficient in a compelling climax and denouement. The post-test version distinctly delineated exposition (Jesi's solitude), rising action (encountering Bob and accepting the invitation), climax (Christmas Eve events), and conclusion (Jesi's transformed view of Christmas). The enhanced sequencing resulted in a more emotionally gratifying tale.

Likewise, Student #12's pretest included an imaginative "what if" scenario but was predominantly dependent on explanation and summary. In the post-test, the student enhanced the storyline by highlighting a pivotal moment (Kiko's delayed arrival) and its subsequent ramifications, leading to a more coherent and compelling narrative.

These enhancements corroborate results indicating the explicit instruction of plot phases improves students' capacity to effectively organize narrative events (Pacheco-Costa & Guzmán-Simón, 2020).

B. Structure and Organization Using the Butterfly-Effect Model

Post-test narratives shown enhanced conformity to the Butterfly-Effect Model, especially in illustrating how a singular little occurrence resulted in extensive repercussions. Although some students first concentrated solely on personal transformation, many subsequently broadened the causal chain to encompass broader societal or historical implications.

In Student #12's post-test, the postponed arrival of the flag led to confusion, a deferred acknowledgment of independence, and a modification of the national celebration—an evident illustration of an extended causal effect. This illustrates the intended application of the Butterfly-Effect Model as an instrument for causally-driven narrative construction.

Qualitative responses suggested that not all pupils completely mastered the model. Some, such as Student #8, concentrated mostly on emotional transformation rather than wider ramifications. This corresponds with evidence indicating that students require continuous modeling and scaffolding to consistently use causal frameworks (van den Broek et al., 2021).

C. Cultural and Holiday Relevance (Philippine National Holiday)

The use of Philippine national holidays as narrative settings significantly enhanced student involvement and narrative depth. Students exhibited enhanced background knowledge and emotional engagement while composing narratives about culturally recognizable occasions, such as Christmas and Independence Day.

Student #12's story, focused on the Philippine Independence celebration, demonstrated enhanced historical understanding and contextual relevance in the post-test. This substantiates studies on culturally responsive writing instruction, highlighting the significance of familiar surroundings in augmenting meaning-making and coherence (Ladson-Billings, 2021; Reyes & Domingo, 2023).

D. Use of Figures of Speech (Clarity, Meaning, and Sound Devices)

The employment of figures of speech shown a modest enhancement in post-test results. Students exhibited heightened efforts to employ descriptive language, imagery, and auditory techniques. Nonetheless, enhancements were more pronounced in clarity and emotional expression than in advanced metaphorical language.

In Student #8's post-test, expressions like "welcomed with open arms" and "season of loneliness" contributed emotional profundity while preserving clarity. Conversely, pretest outputs frequently exhibited ambiguous or redundant phrasing.

These findings correspond with McCarthy and Goldman (2021), who observed that primary students gain from structured practice in figurative language to guarantee that expressiveness does not undermine meaning.

3. Problems Encountered by Students in Using the Butterfly-Effect Model

The qualitative analysis of interview responses identified many reoccurring difficulties.

- Challenges in selecting a suitable "minor event" to begin the causal sequence;
- Obstacles in amplifying impacts beyond individual transformation;
- Preliminary disarray in structuring concepts utilizing the Butterfly-Effect framework;
- Mechanical concerns including grammar, space, and diction.

These issues reflect results from previous research indicating that students encountered difficulties with causal mapping and planning phases prior to developing confidence via experience (Cheung, 2023; Kim & Graham, 2021).

4. Students' Perceptions of the Helpfulness of the Butterfly-Effect Model

Notwithstanding initial challenges, the majority of students characterized the Butterfly-Effect Model as beneficial and captivating. Responses from the interview suggested that the model provided assistance to them:

- articulate narratives with more clarity,
- eschew arbitrary story developments, and
- Consider the ramifications prior to composing.

Students said that visualizing cause-and-effect sequences facilitated narrative preparation and alleviated writer's block. This corroborates research indicating that metacognitive planning tools improve students' confidence and the quality of their writing (van den Broek et al., 2021).

5. Improvement in Overall Story Writing Performance

A comparative comparison of pretest and post-test results indicated a significant enhancement in overall narrative quality. Post-test narratives exhibited increased length, coherence, emotional engagement, and logical structure. Students exhibited enhanced mastery of narrative advancement and thematic evolution.

The integration of explicit teaching, cultural relevance, and causal mapping corresponds with evidence indicating that multi-faceted writing interventions provide more learning advancements than singular tactics (Graham et al., 2020).

6. Performance Task Action Plan Developed from the Findings

A Performance Task Action Plan was established to enhance education in causal-driven story writing based on the results. The proposal encompasses:

- sequential Butterfly-Effect mapping exercises;
- culturally pertinent writing prompts;
- supervised exercise on rhetorical devices;
- analytic rubrics corresponding to narrative structure, causation, and linguistic application; and
- tasks for contemplation and modification.

This output promotes sustainable teaching practices and corresponds with DepEd's focus on performance-based evaluation and genuine learning challenges (Department of Education, 2021).

DISCUSSIONS

The results indicated that the Butterfly-Effect Story Development Program markedly improved students' narrative writing abilities. Enhancements in plot sequence and structure indicate that direct

education in causality facilitated learners in creating more cohesive tales. This corroborates other research highlighting the efficacy of organized story education (Graham et al., 2020).

The students' capacity to incorporate culturally pertinent elements, such as Philippine national holidays, enhanced the depth and significance of their tales. This corresponds with culturally responsive pedagogy, emphasizing the significance of familiar surroundings in literacy education (Ladson-Billings, 2021).

While the employment of figures of speech enhanced, the advancements were more evident in clarity and meaning than in auditory devices. This suggests that although students become more articulate, proficiency in stylistic language elements necessitates extended exposure and continuous effort.

Qualitative findings indicated early challenges in implementing the Butterfly-Effect Model; yet, students' favorable impressions of its use imply that organized planning tools enhance metacognitive awareness and bolster confidence in writing. The amalgamation of causal-driven education, cultural relevance, and performance-based evaluation yielded noticeable enhancements in students' narrative writing abilities.

Recommendations

The study's findings suggest that educators should more regularly use the Butterfly-Effect Model into story writing teaching to enhance students' comprehension of causal linkages in narratives. Explicit modeling of cause-and-effect sequences, enhanced by visual organizers and structured planning exercises, may assist learners in achieving clearer plot development and diminishing dependence on arbitrary narrative twists. Educators could contemplate prolonging instructional time dedicated to figures of speech, especially auditory devices, to further augment students' expressive language while ensuring clarity and coherence.

School administrators may enhance the sustainability of this teaching method by promoting the creation and implementation of Performance Task Action Plans that incorporate culturally pertinent topics, such as Philippine national festivals, into literacy education. Offering professional development opportunities centered on new and research-driven narrative writing processes will better equip educators with effective skills to tackle prevalent difficulties in storytelling.

Future researchers are advised to do analogous studies employing comparative or experimental methods that incorporate control groups or engage learners from diverse grade levels. Longitudinal studies may be conducted to investigate the long-term impacts of teaching in causal-driven tale writing. Moreover, subsequent study may investigate the use of digital storytelling instruments and multimedia platforms to illustrate the Butterfly-Effect Model and enhance students' narrative planning and creativity.

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