# StoryStudio: Enhancing Data Science Education with Explainable, Narrative-Driven Storytelling

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## Abstract

Data storytelling is essential in data science education but often lacks structured guidance. While students learn visualization and modeling, existing AI tools primarily generate stories automatically rather than teaching narrative construction. Few tools integrate storytelling with Jupyter Notebooks, and those that do focus on code generation rather than user-driven storytelling. StoryStudio bridges this gap by integrating with JupyterHub, allowing users to export figures and code into an interactive storytelling interface. It supports figure organization, AI-assisted insight extraction, and structured narrative generation using seven storytelling patterns. Unlike automated tools, Story Studio emphasizes active learning, helping students craft and refine their own data narratives. This poster will showcase Story Studio's role in enhancing visual literacy and data communication in data science education.

## Keywords

Data storytelling, Data science education, Generative AI

## 1 Contents

Crafting and evaluating data stories present many challenges for data science professionals and students. Data stories combine facts and visualizations into a coherent, meaningful, and compelling narrative [2]. Satisfying this diverse array of expectations asks for a deep understanding of narrative storytelling frameworks to effectively convey insights. However, data science instruction often focuses on methods for data visualization, cleaning and modeling, but less so on transforming these outputs into a compelling narrative. Similarly, existing AI-powered inference tools generate visual data trends and stories from tabular data, but they lack the ability to support advanced data science workflows including predictive modeling [3]. We propose StoryStudio, an AI-assisted data storytelling platform to address this gap. It integrates with JupyterHub to import visualizations from Python notebooks, generate captions, structure insights into narratives, and generate stories along with justifications. Unlike similar integrations in recent work [4], StoryStudio emphasizes storytelling rooted in explainable narrative patterns [1], helping students actively shape and refine their rationales for the choice of story, rather than relying solely on AI-generated content. Figure 1 illustrates key features of StoryStudio.

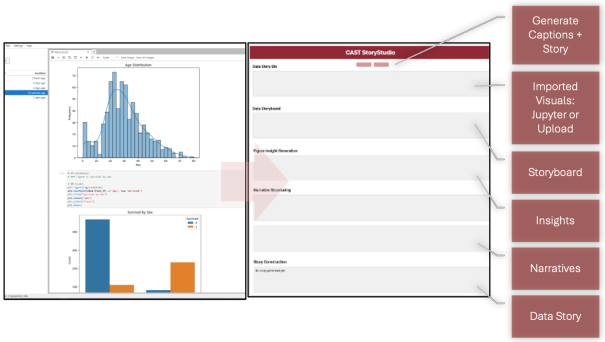


**Figure 1: StoryStudio features a Jupyter-supported (left) web application for storyboarding and explainable, narrative-driven data storytelling (right).**

The objective of StoryStudio is to empower data science educators in the following three ways. First, StoryStudio allows users to arrange their visualizations in a storyboard to explore different story structures. Second, it supports AI-assisted data insight extraction, where visualizations and their associated code are processed using GPT-4o to generate rich descriptions. Third, it arranges these insights into narratives and stories, allowing users (or AI) to select from seven narrative patterns: (1) Time-Based Progressions, (2) Overview to Detail, (3) Cause and Effect, (4) Workflow/Process, (5) Comparison First/Insight Later, (6) Highlight Change/Impact, and (7) Build a Narrative.

By focusing on user-driven storytelling, structured learning, and AI-assisted analysis, Story Studio offers a unique approach to teaching data literacy and communication. It also promises to bridges the gap between technical analysis and effective storytelling in data science education. Our poster will detail the results of a pilot empirical investigation (N=10) to evaluate the effectiveness of StoryStudio in crafting data stories.

## References

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*ITiCSE 2025, Nijmegen, Netherlands*

ACM ISBN 979-8-4007-1569-3/2025/06
https://doi.org/10.1145/3724389.3730811