macmillan learning

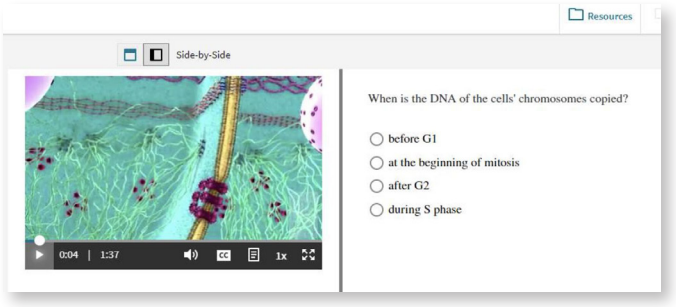
Boosting Student Success with Multimedia Assessments

- Study instructors differed in their implementation of Animation Assessments. Some instructors chose to spread Animation Assessment due dates across a semester, while others had many Animation Assessments all due on the same date.
- Students in the study completed a mean of 13.7 and median of 11 Animation Assessments.
- Students' average Animation Assessment grade was significantly related to both their final course grade and their average exam grade while controlling for their high school GPA.
- Students who had 95-100% average on their Animation Assessments had a 13 pt increase on their course grade and a 14 point increase on their average exam grade compared to those who had 70-85%.

Background

"How Life Works" offers an immersive learning experience through an array of Animations, strategically curated to align with each chapter's content. These Animations serve as a dynamic educational tool that can be seamlessly integrated into both pre-class and post-class assignments, enhancing student engagement and comprehension.

Each Animation is thoughtfully accompanied by a set of six to eight assessment questions designed to reinforce students' comprehension and facilitate knowledge transfer. These assessment questions serve as guiding prompts for students to bridge their visual understanding gained from the Animations with the foundational principles in the chapters.



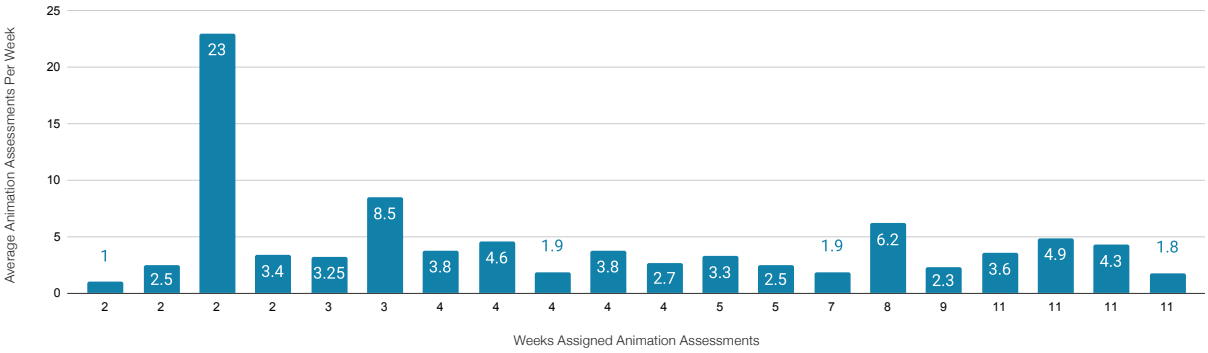
Majors Biology: Morris How Life Works

The use of animations in educational contexts aligns with principles of multimedia learning theory, which posits that combining visual and auditory information can lead to better comprehension and memory encoding than text-based learning alone. Animations, with their dynamic visuals and ability to depict complex processes or phenomena, offer students opportunities to visualize abstract concepts and grasp underlying principles more effectively. The inclusion of assessment questions alongside the animations encourages active engagement and reflection as students interact with the content, promoting deeper processing and conceptual understanding.

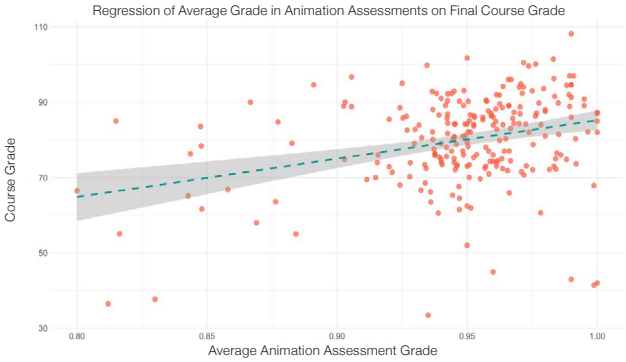
Results

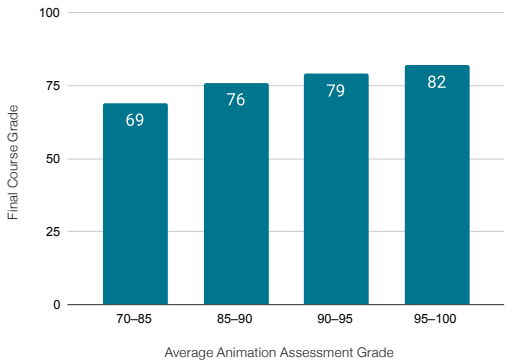
In order to examine the impact of completing Animation Assessments on students' learning, Macmillan Learning funded a series of research studies spanning two semesters from fall 2019 through spring 2020. From these studies, 16 instructors across 20 courses used Animation Assessments in their courses which included 222 Biology major students who consented to share their course performance data.

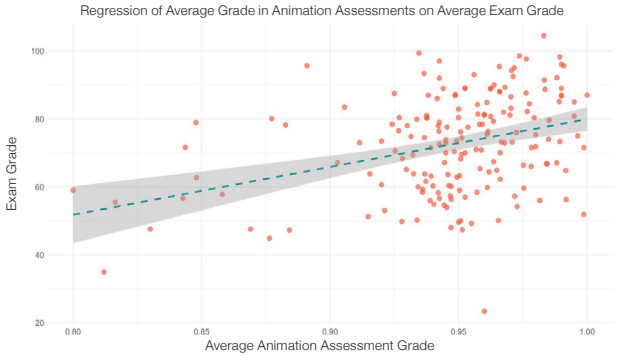
Instructors differed in their implementation of Animation Assessments. They assigned Animation Assessments on average across five weeks within a semester, with a minimum of two weeks and maximum of 11 weeks. Instructors assigned an average of four Animation Assessments within a week, with a minimum of one and a maximum of 24 within a week. This indicates that some instructors chose to spread Animation Assessments due dates across a semester, while others had many Animation Assessments all due on the same date.

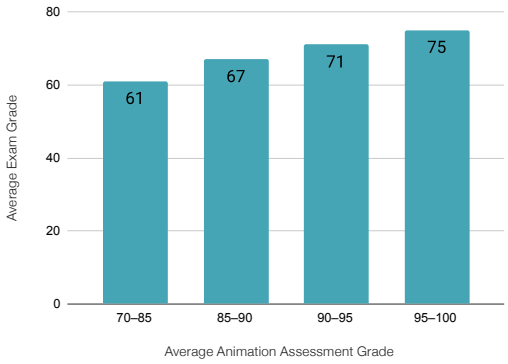


We examined how completion of Animation activities related to student course performance. Using multiple linear regression and controlling for students' reported high school GPA, we found a statistically significant relationship between students' average animation grade and both their final course grade and their average exam grade. Students who had a 95-100% average on their Animation Assessments had a 13 point increase on their final course grade and a 14 point increase on their average exam grade compared to those who had a 70-85% average. This demonstrates that the Animation Assessments were well aligned with the course content and a powerful way for instructors to measure early understanding and ongoing mastery.









In conclusion, the findings underscore the effectiveness of integrating Animations as a pedagogical tool within the "How Life Works" Biology curriculum. The positive relationship between Animation completion and student performance highlights the valuable role of multimedia resources in enhancing student learning outcomes and underscores the importance of leveraging dynamic visual elements to augment traditional educational practices.

Sources
Lowe & Boucheix (2008)
Mayer (2019)