Mahsi’choo for the Info!

*Molly of Denali* Teaches Children About Informational Text
The Importance of Informational Text

Informational text—oral, written, or visual text designed to inform—is essential to navigating daily life, and includes things like reading a map, critically engaging with websites, and asking an expert.

The skills and disposition to use informational text are a fundamental part of literacy; comprehending informational materials such as books and magazines paves the way for future learning, particularly in social studies and the sciences.

That’s why it’s important for young children to learn how to use and create informational text. However, young children typically have much less exposure to many forms of informational text as compared to narrative stories.

Digital media can help fill this gap by introducing the key functions and features of informational text. Intentionally designed videos and games—where appealing characters model when and how to use informational text to solve real-world problems and help the community, while also having fun exploring their environment—engage children and promote learning.

Mahsi’choo

*Mahsi’choo* (Mah-see-cho). ‘Thank You’ in Gwich’in.
The Promise of Molly of Denali

The goal of the new PBS KIDS series, Molly of Denali, is to prepare children to interact with informational text in school and beyond. Public Broadcasting Service (PBS) developed the series in partnership with the Corporation for Public Broadcasting (CPB) and in collaboration with children’s media producers at GBH, as part of the Ready To Learn Initiative, funded by the U.S. Department of Education.

Molly of Denali is the first nationally distributed children’s series in the U.S. to feature an Alaska Native lead character. Molly models the use and creation of informational text in her everyday life, from following a recipe for homemade mosquito repellent to sharing her vlog with kids everywhere.

In this report, EDC and SRI present our research into the impact of Molly of Denali on children’s ability to use informational text to answer real-world questions.
To understand whether the *Molly of Denali* resources impacted children’s informational text knowledge and skills, the research team conducted two studies with a combined total of 263 first-grade children.

In both studies, we examined whether providing low-income families across the U.S. with access to *Molly of Denali* resources, including videos, digital games, and hands-on activities, supported children’s ability to use informational text.

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Design</th>
<th>Participants</th>
<th>Sites</th>
<th>Pre-test</th>
<th>Intervention</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Randomized controlled trial</td>
<td>127</td>
<td>Alabama and Arizona</td>
<td>In-person</td>
<td>Tablet-based, 9 weeks</td>
<td>Remote</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Replication Study</th>
<th></th>
<th>136</th>
<th>National</th>
<th>Remote</th>
</tr>
</thead>
</table>

The figures and data in this report reflect the full, combined sample of 263 children, except where specified otherwise.
Why two studies?

We originally designed a single study with 500 families, but the spread of COVID-19 changed our plans. After beginning with in-person data collection with 127 families in Study 1, we shifted to remote data collection, finishing Study 1 data collection via video conferencing.

We then conducted a fully remote replication study with a separate, national sample.

Replication is a critical part of the scientific process and demonstrates that findings are not the result of something unusual about the original study or participants.
Who participated in the studies?

A diverse national sample of children living in low-income households.

263

First-grade children
(Average age: 7 years old)

Study 1 participants
Replication study participants
**Children**

- 48% were female
- 16% spoke a language other than English at home
- 17% had an IEP or received other special education services or supports

**Parents**

- 23% had up to a high school diploma or a GED
- 69% had an annual household income of $50,000 or less

**Families’ Race/Ethnicity**

- 32% Black or African American
- 28% White
- 22% Multiracial
- 14% Hispanic or Latino
- 2% Indigenous Peoples
- 3% Other
Both studies were nine-week randomized controlled trials.

All participants received data-enabled tablets, and we randomly assigned participants to one of two groups:

1. **Treatment group** – Tablets for participants had curated *Molly of Denali* resources pre-loaded.

2. **Control group** – Tablets for participants blocked access to all of PBS KIDS, as well as other apps focused on informational text.

A randomized controlled trial is a rigorous study design that lets researchers conclude that an intervention (in this case, engaging with the *Molly of Denali* videos and games) caused an outcome (in this case, an improvement in children’s ability to use informational text).
<table>
<thead>
<tr>
<th>Families Received...</th>
<th>Treatment Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samsung Galaxy II tablet with a 9-week data plan</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Instructions to use the tablet for about 1 hour a week</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Text message reminders</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Family guide to study</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td><em>Molly of Denali</em> resources: Videos, digital games, and hands-on activities</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Introductory videos for parents</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Access to PBS KIDS and other informational text apps blocked</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

Mahsi’choo for the Info! *Molly of Denali* Teaches Children About Informational Text
Families in the treatment group received access to the following *Molly of Denali* resources on their tablets:

<table>
<thead>
<tr>
<th>52 videos (39 animated, 13 live-action)</th>
<th>3 digital games</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 hands-on, real-world activities, printed and as PDFs on the tablet</td>
<td>7 introductory videos for parents (2-4 minutes each)</td>
</tr>
</tbody>
</table>

- Each video targeted one or two content areas, while the digital games focused on captions, flow diagrams, and procedural text.
- New animated videos were released every Friday, but children could re-watch previous videos.
- Children’s media usage was tracked using software installed on their tablets.
- The research team organized the resources into “bundles” of content, focusing on the following informational text skills and features:
  - Captions
  - Indexes
  - Search boxes
  - Procedural text
  - Flow diagrams
  - Evaluating sources
For children in the **treatment group**, the study experience was a more structured version of how children can engage with *Molly of Denali* materials in everyday life.

In these studies, families used the resources most in the first week, especially the games. Averaged over the course of the study, children engaged in the resources about an hour per week.

→ **Average Minutes Using Focal Resources (Videos and Games), by Week**

<table>
<thead>
<tr>
<th>Week</th>
<th>Videos</th>
<th>Games</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>168</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>92</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>75</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>48</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td></td>
<td></td>
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<tr>
<td>9</td>
<td></td>
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</tr>
</tbody>
</table>
The research team developed and piloted a standardized assessment to measure children’s ability to use informational text to solve real-world questions.

**Assessment Scores**

- How likely are children to use informational text to solve a realistic problem from everyday life?
- Can children identify structural and graphical features of informational text and use them to answer practical questions?
- Disposition to use informational text
- Ability to identify and use features of informational text

We also measured other characteristics that might affect children’s performance on the informational text assessment:

- Expressive language ability (EVT-3)
- Reading ability (DIBELS-8; Study 1 only)
An index written by a child in first grade after watching Molly of Denali.
What did children learn?

Access to the *Molly of Denali* resources **improved children’s ability to use informational text** to solve real-world problems.

The statistically significant difference between children in the treatment and control groups was driven primarily by improvements in children’s ability to identify and use features of informational text (e.g., captions and Web searches), rather than their disposition to use informational text (e.g., selecting a field guide to identify a bird).

1. **Younger children** benefited more from access to *Molly of Denali* resources.

2. The **more time** children spent with the *Molly of Denali* resources, the better they performed. For every hour that children spent, they scored about a quarter of a point higher at post-test.
The replication study found similar positive and statistically significant impacts as Study 1, with new participants.

The benefit of access to the *Molly of Denali* resources likely reflects measurable learning rather than something unusual about our original study.

**Impact of Access to *Molly of Denali* Resources, by Study**

<table>
<thead>
<tr>
<th>Study 1</th>
<th>Control Group</th>
<th>Treatment Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted Score</td>
<td>8.9</td>
<td>10.4</td>
</tr>
<tr>
<td>Study 1</td>
<td>Replication Study</td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>Treatment Group</td>
<td>13.4</td>
<td>*g = .25</td>
</tr>
</tbody>
</table>

Notes:
* $p < .05$.
$g$ represents Hedge’s $g$, a measure of effect size.
Children’s ability to use informational text to answer real-world questions is critical to their success in school and in life. This research is the first to show that children can learn about informational text from digital media.

Educational media can support children’s learning at home. These studies provide further evidence that learning can take place when children engage with intentionally developed, high-quality digital content at home. This is particularly important at a time when millions of children’s in-school education has been substantially disrupted due to the COVID-19 pandemic. It is also meaningful for children who lack access to quality early learning opportunities.

These are promising impacts for a short-term, light-touch intervention. Although the effect sizes were modest, they were nonetheless notable for a nine-week intervention in which children only interacted with Molly of Denali resources for about an hour a week on average. Quite often, educational interventions rely on intensive yearlong curricula to achieve similar impacts.

The findings successfully replicated with new participants. Few findings in education research are confirmed by conducting the same study a second time. Our successful replication helps to confirm the impact of the Molly of Denali resources on children’s informational text skills.

Education research can continue during a pandemic. The replication study occurred during a pandemic, which meant data collection happened entirely remotely. Capacity to perform these kinds of fully remote studies is essential to the continued performance of education research.
Learn more

This overview is just the beginning. Our full report includes complete research questions, findings, data tables, and much more.

Visit: edc.org/infotext
We are extremely grateful to the participating families who took the time from their busy schedules for these studies. Without their participation, this research would not have been possible.

We appreciate community outreach provided by PBS member station, Alaska Public Media (Anchorage, AK).

We also would like to thank Dr. Nell K. Duke, literacy advisor to the PBS/CPB Ready To Learn Initiative and University of Michigan Professor of Literacy, Language, and Culture, who provided invaluable feedback at multiple stages of the research.

Finally, we would like to thank the Alaska advisors who helped us ensure that our methods and assessments were culturally relevant, and respected the traditions and values brought to life in *Molly of Denali*:

- **Dr. Barbara L. Adams**, Owner and Chief Analyst, Adams Analytic Solutions
- **Edward Alexander**, MEd, Education Manager at Tanana Chiefs Conference
- **Martha Gould-Lehe**, MEd, Education and Cultural Specialist at the Southeast Regional Resource Center (SERRC)
- **Dr. Carie Green**, Associate Professor at the University of Alaska (Fairbanks)
- **Angela Larson**, MA, Founder and Principal Evaluator for the Goldstream Group
About EDC

**Education Development Center (EDC)** is a global nonprofit that advances lasting solutions to improve education, promote health, and expand economic opportunity. Since 1958, we have been a leader in designing, implementing, and evaluating powerful and innovative programs in more than 80 countries around the world.

About SRI

**SRI Education**, a division of SRI International headquartered in Menlo Park, California, is tackling the most complex issues in education and learning to help students succeed. We work with federal and state agencies, school districts, major foundations, nonprofit organizations, and international and commercial clients to address risk factors that impede learning, assess learning gains, and use technology for educational innovation.

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How Did the Moon Form?

The Moon came to be is still a great mystery. Many scientists believe that the Moon was formed when a planet-like body about the size of Mars slammed into Earth when the Earth was still very young. This sent up a cloud of debris that eventually coalesced to form the Moon.

As the Moon orbits Earth, its phases change over time. The Moon's illumination comes from the Sun, and the amount of the Moon's sunglit surface that is visible from Earth changes in the amount of the Moon's sunglit side that is visible from Earth.

At the beginning of the cycle (the "new" Moon phase), none of the sunglit side can be seen. The Moon is completely dark, so it appears completely dark in the night sky. Then gradually, over the next two weeks or so, the shape of the Moon increases.