

Suggestions for Instructional Materials

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This version of the document is dated 2024-05-10.

These are suggestions to improve core and supplemental instructional materials, for all school subjects, used in U.S. schools from kindergarten to twelfth grade.

1. Instructional materials should be open educational resources (OER), available to anyone under an open license, such as CC-BY-NC-SA (Creative Commons Attribution-NonCommercial-ShareAlike) or a more permissive license. For the instructional materials, there should be a GitHub or GitLab repository containing the source code of the materials. This may make it easier for the general public to view, edit, give feedback on, and suggest changes to the instructional materials for various reasons, including the following:
 - To reduce cognitive load on students and teachers (without reducing rigor).
 - To improve historical accuracy and cultural responsiveness.
 - To correct errors.
 - To best take advantage of research on how people learn (such as retrieval practice and interleaving of topics).
 - To keep the materials up to date with scientific, technological, and historical scholarship.
 - To reduce preparation time for teachers.
2. Instructional materials should adopt, as much as possible, **Rosenshine's principles of instruction**¹ (Amer. Educator, spring 2012).² Instructional materials should avoid “minimally guided instruction”, such as discovery learning, because such instruction often goes against research on how people learn (e.g., cognitive load theory). A paper by Kirschner and colleagues called “**Why Minimal Guidance During Instruction Does Not Work**”³ (Educ. Psych. 41, 2006) gives details.

One of Rosenshine's principles is weekly and monthly review; examples are low- or no-stakes retrieval practice (quizzing) every week, or the **brain/book/buddy protocol**⁴ popularized by Blake Harvard. Another principle is teachers asking many questions and checking every student's response (e.g., “**Ratio**” by Adam Boxer⁵).
3. In Literacy, instructional materials should be knowledge-based and follow the criteria given in the **Knowledge Matters Campaign's review tool**⁶. In other subjects, instructional materials should likewise be **knowledge-rich**⁷.
4. There is guidance for:

¹<https://www.aft.org/sites/default/files/Rosenshine.pdf>

²Similar principles are also found in *Explicit Direct Instruction: The Power of the Well-Crafted, Well-Taught Lesson* (Hollingsworth and Ybarra) and *Direct Instruction: A Practitioner's Handbook* (Kurt Englemann).

³https://www.tandfonline.com/doi/abs/10.1207/s15326985ep4102_1

⁴<https://theeffortfuleducator.com/2019/03/13/brain-book-buddy-a-strategy-for-assessment/>

⁵<https://achemicalorthodoxy.co.uk/2020/02/09/ratio/>

⁶<https://knowledgematterscampaign.org/review-tool/>

⁷<https://teacherhead.com/2018/06/06/what-is-a-knowledge-rich-curriculum-principle-and-practice/>

- Increasing rigor and quality of **Latino American content**⁸ and **black American content**⁹ in U.S. History instructional materials.
 - Improving **cultural responsiveness**¹⁰ in Literacy instructional materials.
 - The length of daily Social Studies and Science instruction up to fifth grade: **45 minutes**¹¹ and **60 minutes**¹², respectively.
 - Structuring lessons in History and other aspects of Social Studies using the **Four-Question Method**¹³.
 - Structuring lessons in U.S. Civics using the questions in the civics portion of the naturalization test given by the U.S. government.
 - **Instructional practices**¹⁴ for Mathematics.
 - Offering numerous **options to do beyond-grade-level content and exercises**¹⁵ for willing and ready students, as long as these options are always presented to all students¹⁶.
5. Instructional materials in Literacy should teach synonyms for new words to be learned and for other words and phrases prone to overuse. In sixth grade and up, they should include copious lessons on grammatical analysis and knowledge of English syntax, as well as concrete guidance to help students avoid the following in their writing:
- Overuse of certain words or phrases, both within and across writings¹⁷.
 - Imprecise word choices, especially choices of overused words.
 - Redundancy (which includes unnecessary words) not serving an expressive purpose.
 - Ambiguous language.

These suggestions concern only instructional materials, so policies such as those that **restrict mobile phones in school**¹⁸ or encourage the **reduction of classroom decorations**¹⁹, while they may help reduce students' cognitive load, are outside the scope.²⁰

Suggestion number 5, in particular, is intended to address observations that our language may be getting poorer by the year, in terms of everyday vocabulary and linguistic variety (see, e.g., Emilio Bernal's "Good usage prevents abuse").²¹

⁸<https://unidosus.org/publications/analyzing-inclusion-of-latino-contributions-in-us-history-curricula-for-high-school/>

⁹<https://hub.jhu.edu/2021/02/10/black-history-curricula-lacking-rigor-and-quality/>

¹⁰<https://steinhardt.nyu.edu/sites/default/files/2020-12/CRE%20Scorecard%20Revised%20Aug%202020.pdf>

¹¹https://ccsso.org/sites/default/files/2018-11/Elementary%20SS%20Brief%2045%20Minute%20Version_0.pdf

¹²<https://www.nsta.org/nstas-official-positions/elementary-school-science>

¹³<https://4qmtaching.net/>

¹⁴<https://www.thescienceofmath.com/>

¹⁵<https://slatestarcodex.com/2018/09/04/acc-entry-does-the-education-system-adequately-serve-advanced-students/>

¹⁶One example, similar to the approach found in Illustrative Mathematics, is the presence in student workbooks of "Are you ready for more?" followed by a challenging exercise. Another example is a relatively short unit on basic calculus concepts such as limits and continuous functions at the end of Algebra 2, such as the last unit of **Fishtank Learning's Algebra 2 course**. <https://www.fishtanklearning.org/curriculum/math/algebra-2/>

¹⁷A list of some of the **overused and discouraged words** is given elsewhere. The works of Emilio Bernal Labrada, Theodore Bernstein, Mario Pei, Bill Bryson, and Richard Lederer, among others, provide guidance on good English usage.

¹⁸<https://www.educationnext.org/take-away-their-cellphones-rewire-schools-belonging-achievement/>

¹⁹<https://www.learningandthebrain.com/blog/getting-the-principles-just-right-classroom-decoration/>

²⁰Additional suggestions to improve education, which instructional materials could choose to address, are as follows:(1) Encouraging caregivers to keep mobile phones and social media away from their children, especially if the caregivers themselves use **social media for 1 hour or more daily**.(2) A playlist of made-for-kids videos relating to topics in the Core Knowledge Foundation's **Core Knowledge Sequence** (especially videos that invite viewers to answer questions on the topics), for each grade from kindergarten to eighth grade, intended for children to optionally watch at home outside of instruction.(3) The "Good Behavior Game" as a way to encourage students to follow classroom norms.(4) For Literacy, a free and open-source English grammar reference book designed for middle school and secondary students.(5) The recognition that Social Studies encompasses history, geography (natural and human), culture, civics, and economics and instruction in Social Studies should be knowledge-rich and lay an accent on the country and locality where the instruction takes place. <https://www.hhs.gov/surgeon-general/priorities/youth-mental-health/social-media/index.html> <https://www.coreknowledge.org/core-knowledge-sequence/>

²¹A list of some of the **overused and discouraged words** is given elsewhere. The works of Emilio Bernal Labrada, Theodore Bernstein, Mario Pei, Bill Bryson, and Richard Lederer, among others, provide guidance on good English usage.

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2 Endnotes

²²<https://creativecommons.org/publicdomain/zero/1.0/>