SB 854 Testimony; Suggested Amendments

I support SB 854, at least in concept. I prefer an alternate approach to climate change education that I think is far better and faster.   My qualifications to speak to the issue:

I was born in Oregon and graduated from OSU in 1962. Later I taught high school physics, then became an Urban Planner.   My MUP thesis project was writing computer programs to project populations, which made me a feminist and helped me understand migration. So did *The Limits to Growth* (1972), Meadows et al. Later I taught software development to professional software engineers, world-wide. This career combination led to suggestions I present here, focusing on how we learn, and learning models. Now retired, I'm a futurist and climate activist.

Legislation, software, and curricula are all similar: precise knowledge about how to do something. Each can follow different models to learn a topic.

- **Legislation** follows a strict quality control process: "How a Bill Becomes a Law." Review and amendment is so thorough that most final products are stable and able. Costly and time-consuming, its goal is to "Get it right the first time," so few wish to restart the process to fix small errors. The process generally works. The current SB 854 is typical.

- **Software** can be defined as "knowledge about knowledge." Early software development followed a *top-down model*: first systems analysis, then design, and finally code and test to ensure it works as required. Too often customers say, "This is not what we want." And too often developers reply, "But this is what you asked for. See your specifications…" Eventually software people learned to "Plan to throw the first one away; you will anyhow."* Rapid prototyping of small products taught users what they wanted, recognizing that *"first learning is always by trial and error."* Small functions are now learned and tested, then cataloged into a library so others could find them. The library modules are typically more carefully designed, but their big advantage was hiding internal details from developers, cutting what they had to learn. This allowed development to be both *bottom-up* and *top-down.* Much software development is overdue and over budget because *time to learn* is hard to estimate. It requires a guess of how much your team doesn't know about a topic. (Precisely how much do you *not* know about climate change and our future?)

- **A curriculum** is also knowledge about knowledge.   Clearly, we must learn more about climate change. How? SB 854 proposes the top-down model of what to learn, requiring school boards to prepare a plan to teach about climate change. The plan has these flaws:
  - o It's an unfunded mandate to ask boards, who may not understand climate change, to develop a K-12 curriculum by June 1, 2026. Climate change is an emergency needing immediate action. Lesson plans, like software, need testing and tuning to work well. Generally we teach to plans the after plans are ready. This approach is that by 2026 the systems analysis and design is done, but no code (lessons) has been written. Too Slow!
  - o "The curriculum must be updated every 7 years." Too slow! A library development model puts lesson plans and evaluations in libraries continuously, and best plans quickly surface and evolve. Climate change is so new, still denied by many, and so dynamic that update must be constant. The current model suggests a K-12 sequential curriculum, which takes 13 years to test and tune. By then, everything has changed. If every teacher in every grade or subject develops and submits a lesson plan for an hour, a day, or a week, by the end of one year the library could be a rich resource.

o DoE should lead, instead of asking each school district to reinvent the wheel. The library will become the center of a large communication network, that will allow committees to form and further develop subject matter.

How we learn. *All first learning is by trial and error.* The key is finding errors quickly, and removing them. Errors are found by testing, both early and late. Teachers develop packages of knowledge and teach it, then evaluate it to identify possible improvements. They submit it to a library, where it is cataloged and made available to others, who teach it, add their improvements and lessons-learned, and resubmit it to the library. Graphics and activities are recommended, and these take far more time to develop than talking-head lessons. Over time, the library grows in breadth and depth, in **quantity** and **quality**. The library, electronic in nature, is maintained at a central location by professionals to maximize its access and reuse potential.

Government generally discourages duplication as wasteful, but evolution shows competition fosters progress. So amend SB 854 into a library model, to be managed by DoE at the top, cataloging lesson plans as they are developed during 2023-2024 academic year. Ask *every* K-12 teacher to submit one or more lesson plans, with evaluations, and ratings on 5-star scales. Blogs have a process where other teachers can offer comments on the original, and comments on comments. Lesson plans with substantial modifications may become new entries. Suggest a process to reward teachers for good submissions, and to have them request assistance to develop new concepts or methods of teaching climate change. Do not include in the legislation the evolutionary details; these will emerge at the DoE level as the project evolves. The process I see is design-as-you-go; design should not be embedded in the enabling legislation. The first thing to realize is that we don't know what we're doing, but out of such a process will come brilliance. I'm ready to help any way I can.

Respectfully,
John Weigant (Elders Climate Action--Oregon Chapter)

*Fredrick P. Brooks, Jr: *The Mythical Man Month, Essays on Software Engineering,* (1982)

Final observation: The future requires a *paradigm shift* if we are to survive it. Growth in **quantity** has limits, demanded by the physics laws of conservation of mass, energy, and momentum. Capitalism and "economic development" assume quantity growth can be perpetual. It cannot. Earth is finite, with nowhere to go nearby worth going to. Limits of time and space mean exoplanets require a much-faster-than-light space drive, believed to be both practically and theoretically impossible. We are earth-bound. Experience shows information has grown exponentially since earth's birth, and is still accelerating. Information embedded in things measures their **quality.** So things can always get better, even if they can't get much bigger. Two general paradigms are in conflict. **Conservatives** generally look backward for guidance, to repeat past successes, but now take us to destruction. **Progressives** look to the future, clouded as it is, for guidance. SB 854 is a conservative approach to future problems: climate change. People looking backwards must "turn around," "shift their minds," called in Greek *metanoia* (literally "higher knowledge) in the New Testament, but translated to "repent" in English.

<div align="center">**Suggested Amendments of SB 854**</div>

Section 1. No change.

Delete   Sections 2.(1), 2.(2), 2.(3) & 2.(5)

Section 2.(4) The Department of Education shall: **(new text in bold)**

(a) In consultation with the Department of Environmental Quality, the Oregon Health Authority and other interested stakeholders, develop and adopt a model plan to provide guidance to school districts in establishing a climate change instructional program under this section.

(b)(A) Develop academic content standards for a climate change instructional program and shall prepare materials to support school district training and classroom instruction in climate change education; and

(B) Provide academic content standards developed under this paragraph to ensure that school districts are able to establish a climate change instructional program to offer instruction that meets the academic content standards no later than the ~~2026-2027~~ school year. (do sooner)

(c) Review and approve activities, resources and materials developed by the Department of Environmental Quality, the Oregon Health Authority and interested stakeholders that meet the academic content standards for the climate change instructional program developed by the Department of Education and make available a list of the approved activities, resources and materials to school districts.

(d)(A) Create an electronic library to receive, catalog, evaluate, correct as needed, and disseminate climate-related lesson plans for free distribution to all school districts and teachers in the State, and elsewhere by agreement.

(B) Develop a system to motivate teacher contributions to the library.

(C) Cooperate with Educational Service Districts as mutually agreed.

Delete: SECTION 3. ORS 327.180 is amended to read:

…

(2)(c) Meet the climate change instructional program requirements under section 2 of this 2023 Act. (This is the only change in this long section, now irrelevant)

Delete: SECTION 4. ORS 327.185 is amended to read: (only change in this section, now irrelevant)

…

(8)(d) If applicable, a statement describing how a school district is meeting the climate change instructional program requirements under section 2 of this 2023 Act

Note: SB 854, originally 6 pages, now shrinks to 1 page. Bear in mind: these suggested amendments are offered by an amateur with no experience in crafting legislation. Other changes may be needed. –John Weigant