The "Improve" Activity Types

Computer programmers must be able to troubleshoot, debug (identify and correct program errors), test, and refine computational artifacts to enhance their reliability and performance. This process must be iterative and take into consideration the ever-changing needs of end users. Students must act as computer programmers within the classroom, continuously testing and refining their products.

Table 6: "Improve" Activity Types

	Brief Description	**Possible Technologies**
Test Artifacts	Students systematically test computational artifacts to determine if criteria and constraints are met.	LMS (e.g. Schoology, Edmodo), Q&A platform (e.g. Piazza), online feedback (e.g. Peergrade), coding learning environments (e.g. CodeStudio, Codecademy, CodeBender, BlueJ)
Debug/Troubleshoot	Students troubleshoot computer systems and systematically debug errors in computational artifacts.	Development platforms/communities (e.g. GitHub, StackOverflow), coding learning environments (e.g. CodeStudio, Codecademy, CodeBender, BlueJ), Q&A platform (e.g. Piazza)
Refine Artifacts	Students evaluate and refine artifacts to enhance their performance and reliability.	Online feedback (e.g. Peergrade), coding learning environments (e.g. CodeStudio, Codecademy, CodeBender, BlueJ)