

Mobile Response System: A Novel Approach to Interactive and  
Hands-on Activity in the Classroom

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**Conflict of Interest:** The authors declare that they have no conflict of interest.

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### Abstract

Mobile devices are being used profusely in the classrooms to improve passive learning environments and to enhance student comprehension. However, with respect to students' active involvement in problem solving activities, the typical usage of the mobile devices in answering multiple choice and true/false questions is not adequate and the use of mobile devices need to be expanded to include dynamic and interactive problem-solving activities to better satisfy students' learning needs. To facilitate such interactive problem solving using mobile devices, a comprehensive software environment is necessary. This paper details the design, deployment and evaluation of Mobile Response System (MRS) software that facilitates execution and assessment of multi-step in-class interactive problem-solving activities using mobile devices. MRS is an active learning tool, which engages students with the visual representation of a problem that spans on multiple screens, allows them to interact with that, and makes them realize the consequences of their actions instantly and visually. The immediate and automated grading feature of MRS enables a feedback-driven and evidence-based teaching methodology, which is important to improve the quality of classroom learning. MRS is designed to be independent of any interactive problem or its domain. Therefore, it allows easier integration of interactive activity Apps developed by others and can be used in any discipline. The results obtained from software metrics and runtime performance data verified the quality of the software. Additionally, the in-class assessment data verified that the MRS software is a helpful intervention for improving student comprehension and satisfaction.

*Keywords:* Interactive learning environments, architectures for educational technology system, technology-enhanced classroom teaching, mobile technology.