Over the last 2.5 years we have been applying the CWSEI approach to modifying the primary Computer Science systems courses. These courses are: CPSC 213 (Introduction to Computer Systems), CPSC 313 (Computer Hardware and Operating Systems), and CPSC 319 (Internet Computing).

All computer science majors are required to take CPSC 213 and except for a few combined majors all are required to take CPSC 313. CPSC 317 is an elective course in computer networking taken by well over half our students. Given our limited resources (1 person @ 20%) we focused on undertaking transformations and interventions that have worked well in other disciplines.

In all the courses we:

- Articulated the course level learning goals
- Articulated the finer grained learning goals
- Undertook pre- and post- course attitudinal and surveys and identified key exam questions to provide baseline data

**Learning Goals and Baseline Data**

**In Class Interventions**

1. Clicker questions
2. Learning Catalytics
3. In-class worksheets
4. 2 stage exam with group quizzes

**Feeding Back**

- Post survey questions used to identify course presentation and organization needing improvement
- Exam questions results correlated to interventions to identify what works and what doesn’t

These measurements are being used to iterate over our course changes.

The work in these courses has been in part undertaken by:
- Mike Feeley (213/313), and George George Tsiknis (213/313), Bill Aiello (317), Donald Acton (313/317).
- Norm Hutchinson has also provided valuable comments and suggestions

**Instructor Resources**

- Documented course timelines:
- Recorded lecturers to provide future instructors an opportunity to observe how content is presented and the amount of time used
- Complete set of lectures time materials and assignments