Report from the Task Force on Classroom Responders ("Clickers")
Spring 2010
April 14, 2010

Gail D. Burd, Ph.D.
Vice Provost for Academic Affairs
The University of Arizona

Dear Dr. Burd:

The full Responder Committee met three times with the last time being on March 22, 2010 when representatives of the three primary vendors (i-Clicker, E-Instruction, and Turning Technologies) made brief, but comprehensive presentations. A sub-committee met several times and exchanged ideas via email frequently.

Following the 22 March meeting the discussion via email among members of the full committee made it clear that Turning Technologies RCXR Clicker with the option of the browser-based ResponseWare was if not preferred by all, was acceptable to all. A summary of the committee’s evaluations prepared by Dr. William Neumann is appended. Also, appended are the invitation to the vendors and their responses to the committee prior to their presentations, plus the names of participants in the three meetings of the full committee.

My understanding is that it is possible for students to use either the TurningPoint ResponseWare or the Clicker in a given classroom, if set up appropriately, so that a student would not need to purchase both. We are operating under the assumption that offering the option of browser-based clickers will not be an added cost to the students or the University, but we did not want to pursue this further without additional guidance from you.
For classroom support of instructors, we recommend the adoption of the TurningPoint and TurningPoint Anywhere polling software solutions (said to be provided at no cost when you adopt the TurningPoint clickers and/or ResponseWare).

The committee feels that this portfolio of solutions will provide instructors with the freedom to tailor a solution to meet the diverse needs of our classes while still providing a consistent and cost-effective solution for our students.

I trust these findings are of value to you and that they will be of assistance to you in developing a uniform responder policy at The University of Arizona.

Respectfully,

[Signature]

James J. Riley
Associate Professor

Attachments:

1. Letter of invitation to vendors
2. Response of vendors to the motions (three files)
3. Summary of dialogue among committee members prepared by W. Neumann.
4. List of participants in the three meetings of the full committee.
Responder Committee Members

Albrecht Classen  
Andrew Grall  
Amy Fountain  
**Bill Neumann**  
Cecile McKee  
Elaine Marchello  
Jane Hunter  
Janet Nicol  
**Jim Riley (Chair)**  
Joellen Russell  
**Joyce Hamilton**  
Julia Kamp  
Julie Feldman  
Kate Rehkopf  
Katie Hirschboeck  
Lynda Kelly  
Matthew Swatzel  
Robert Indik  
**Ron Landis**  
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mckee@email.arizona.edu  
ev@email.arizona.edu  
jhunter2@email.arizona.edu  
nicol@email.arizona.edu  
jliriley@ag.arizona.edu  
jrusssell@email.arizona.edu  
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rlandis@email.arizona.edu  
sjorstad@email.arizona.edu  
delanney@email.arizona.edu  
taf@as.arizona.edu

*Bolded names are members of the Responder Sub-Committee*
Dear (Vendor Representative Name)

The Vice-Provost’s Office convened a committee to develop some uniformity in the responders on the campus of the University of Arizona. The Committee passed the following two motions:

Motion 1

The committee makes the following recommendations to the Vice-Provost’s Office regarding the contract terms and policy regarding responders:

1. Vendor will provide response solutions that include clickers and software that supports web-browser-based solutions.
2. Emphasis must be on minimizing costs to students over 4-year period.
3. Bookstore will provide products with reasonably priced options for rental or buy-back and replacement of inferior units.
4. Recommended firm must provide timely, complete service, support, and on-campus, one-on-one instruction of faculty planning to use supported systems.
5. Vendors may offer simple and/or more-comprehensive models.
6. Vendors must provide continuous technical support and training to UA 24/7 personnel in order that they can provide support for students and faculty.

Motion 2

The selected vendor will provide a system that has the ability to deliver the following classroom services:

1. Easy to set up and use by faculty and students.
2. Easy for faculty to integrate responder systems with existing or new PowerPoint slides on Mac or PC.
3. Display to students verification of receipt of student responses.
4. Record the individual response of students and display on the screen composite class responses in a bar diagram (or equivalent) when polling is completed.
5. Easy to communicate with and integrate into d2l and/or Blackboard for entry of question points and/or automatic recording of attendance.
6. Preferably, provide units that display battery status and connectivity (not required).

We are inviting your firm to attend a meeting at which you will be given 20 minutes to demonstrate the ability of your firm to meet the requirements set forth by the Responder Committee. The meeting will be held on The University of Arizona campus at 3:00 p.m. on Monday the 22\textsuperscript{nd} of March in Room 202 of the Modern Languages Building. Please confirm your attendance.
Furthermore, the Responder Committee has asked that you indicate prior to the meeting via email whether your firm can meet the specifications given in the items in Motions 1 and 2. In addition, some of the committee members have raised other points, which we ask you to consider:

a. Can you offer a responder that is capable of text entry? (Note in Item 5. of Motion 1, that vendors may provide simple as well as complex responders.)
b. Can you assure us that the products won’t interfere with other commonly used/University sponsored technologies for large classes?

Once we receive your confirmed attendance, we will provide you with more details and we ask that you let us know your requirements for your presentation. Also, we ask that you send us any questions you may have regarding the items outlined in this letter.

Sincerely,

Joyce Hamilton
Overall

In general, all of the solutions performed well on basic multiple-choice polling. Based on our own experiences, all of the solutions can grade an assignment and upload it to D2L. Also, all seem to have the capacity and the range for classes as large as Centennial. All vendors have browser-based options available or soon-to-be released, although the number of platforms and the depth of technical and field experience with these products vary by vendor.

The proposed responders now use standard (AA or AAA) batteries. They all use that annoying screw, which we found out was required for use in K-12 applications, since the batteries represent a choking hazard to children. With low-cost and easily replaced batteries, we would expect the proposed clickers could be used for several semesters at a relatively low operating cost.

Although they use slightly different approaches and sections of the RF spectrum, all of the solutions can co-exist with UAWiFi, in many cases with little or any action by the instructor or Classroom Technology Services. Finally, each vendor offered options for on-campus support of their products, from basic product setup and support, to direct training of instructors, CTS, and the 247 Help Desk.

eInstruction

eInstruction seems to be going through a repositioning of their product line. While our existing Interwrite PRS clicker is still supported, it's no longer available from eInstruction, so the value of our existing experience with PRS interwrite clickers is diminished. The new Pulse clicker seems to be a step back with a smaller, harder to read display, albeit a somewhat more rugged package. The reliability of the Pulse is an unknown, since it's only been on the market for a relatively short time; however, the Pulse is similar to the CPS clicker which has been out for some time and has a good track record.

A significant advantage of the product is that eInstruction bundles the clicker and the browser-based license in a single purchase price. Also, the Pulse includes the ability to store user information in the clicker for auto-registration purposes.

iClicker

The main advantage of iClicker is that it's simple and straightforward to use. The instructor's control clicker allows the presentation to be controlled using a standard iClicker. The fact that the polling software floats over any applications that's running makes the system relatively easy for an instructor to use, but does have the limitation that you have to publish the results of polls as screen-shots.

One concern was the size of the receiver. In contrast to the eInstruction and Turning Technologies, the receiver for the iClicker is a relatively large device. However, if iClicker was adopted campus-wide, more than likely these devices would be built-in to the instructor's podium, so the size of the receiver would only be an issue with instructors wanting to setup these clickers on an ad hoc basis.
The design of the iClicker does not allow students to program user data into the responder. This will likely be a problem for instructors that build participant lists in class, since it would make registration more complicated (i.e., creating an ad hoc class (participant) list that includes student identification would not be possible.

Another concern was that all 5 answer keys are always live. Not only does this allow students intentionally to respond with incorrect answers, but also it permits students to submit invalid answers. This is a pedagogical concern, since it allows careless mistakes to go undetected by the student. Also, only being able to submit an A-E response to questions is a fairly significant instructional limitation.

One significant advantage of the iClicker is that it is based on the 915 MHz ISM band. Therefore, the iClickers system is less susceptible to interference problems with other wireless devices (Bluetooth, WiFi, wireless mice, etc. that operate in the 2.4GHz ISM band). Although 915 MHz is still an unlicensed ISM band, the number of devices that share 915 MHz is much less than the 2.4 GHz band.

**Turning Technologies**

Turning Technologies was considered to be the most complete solution. They have a fairly robust PowerPoint integration (it has its limitations, but overall, it’s works well), and also offer a polling solution that floats over the applications, for instructors who do not use PowerPoint in class. In addition to physical clickers, the company also offers a browser-based and some native applications for smartphones (iPhone, BlackBerry, etc.), which have a much more capable user interface.

Although Turning Technology offers the RF and RF-LCD (telephone keypad-style) clickers, the only one that offers programmable user data is the (calculator-style) XR clicker. Although the XR’s lack of a QWERTY keyboard requires characters for text answers to be entered on character at a time, the XR clicker does allow you to enter multiple answers and more complex values (i.e., 3.1415), and the larger display makes the responses much easier to read. The XR clicker provides several types of feedback to the user including active channel, remaining battery life, whether the answer was received, and a large-format display with the user’s answer.

In terms of support, Turning Technologies included several good offers – from on-site technical and instructional training to webinars, on-call support, and support for dedicated student internships. Based on the example shown in the demo, Turning Technologies has significantly improved the interface for to make loading data into D2L.

(Disclaimer – I’ve been using Turning Technologies for several years. As a result, I’m much more knowledgeable and familiar with Turning Technologies solutions, and less so with those of iClicker and Clicker; however, I’ve made every effort to be as objective as possible in these comments.)

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