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Organizing a Student Poster Session in an ASEE Section Conference

Abstract

Student poster sessions at conferences can be valuable experiences for undergraduate and graduate students and can enrich the conference program for all participants. Student poster presentations beyond the local campus can provide additional experience in professional communication (especially in preparing succinct abstracts and in effective visual design), can prepare students for future conference participations, and can facilitate student-faculty interaction. Several issues exist when including student poster sessions in engineering education conferences. How can the content of posters be related to an engineering education theme? How are communication principles of audience and purpose incorporated into the session guidelines and review process? What approaches facilitate student participation? What roles do faculty advisors have? The organization of a student poster component at section ASEE conferences is described including session objectives, submission process, acceptance criteria, best-poster rubrics, and suggestions for future implementation. Lessons learned during two years of hosting such as poster session are highlighted especially with regard to the abstract and poster evaluation rubrics. The approach seeks to disseminate existing student project work, to involve students in formal review and revision processes, and to recognize the role of faculty advisors.

Introduction

Engineering projects provide important technical and communication experiences for undergraduate and graduate students. Senior capstone, thesis, design, and other project activities are means to develop teamwork and communication skills. ABET student outcomes reflect these critical skills [1] and experiences applying soft skills in the context of project work are valuable. The process of documenting a project and presenting the results enhances one's technical understanding in ways that students do not often appreciate. Technical poster presentations are a common communication mode in which effective delivery depends heavily on succinct expression, audience analysis, and visual design. Much of the literature related to poster presentations deals with course-level poster presentations [2-6], campus research event organization [7,8], and professional communication instruction. The importance of expectations and visual design is noted [2,3]. Various rubric and evaluation approaches have been tried [2,7,8].

Often project documentation and presentation are limited to local venues (especially for undergraduates), documentation is not subject to iterative formal revision, and communication modes are limited to written comprehensive reports and oral presentations. Opportunities to present technical work at conferences can provide additional experience in professional communication (especially in preparing abstracts and in visual design), can prepare students for future conference participation, and can enrich the conference program for all participants. While student poster sessions are part of some technical conferences, there is much that can be done to improve student participation and to enhance student professional development.

As a means of providing better opportunity for students to practice these skills, the ASEE Midwest Section organized a student poster component into its annual Midwest Section Conference. Undergraduate and graduate student authors, most of whom had little conference experience, presented design project posters which emphasized technical accomplishments and design lessons learned. The work of faculty advisors was recognized by allowing faculty to be secondary authors. The objectives, challenges, process, and lessons learned of such a poster session are discussed. These poster sessions have been hosted for two years and are becoming a permanent part of the ASEE section conference. The approach has successfully attracted student authors to the ASEE section conference and has encouraged student-faculty interaction. The structure of the Section Conference poster session and lessons learned can guide others in organizing student conference events.

Student Poster Session Overview

A. Objectives and Scope

The intents of the Student Poster Sessions were to showcase student project work and to build student communication skills. These poster presentations of project accomplishments provided an outlet for student work that may not be externally reported otherwise and such presentations gave students a valuable opportunity to revise and polish the initial project documentation. From the perspective of the conference planners, the session objectives were:

- To involve students in a professional conference,
- To facilitate interaction between students and educators,
- To disseminate examples of student project work,
- To promote effective technical writing (especially related to executive summaries and to audience analysis),
- To promote skill with effective visual communication of technical content, and
- To provide student experience with oral and interactive communication related to their technical work.

The ASEE Section Conference level provides distinct advantages to student poster involvement. The poster sessions were open to student authors at both the undergraduate and graduate levels. As regional conferences, the venues provided good first experiences beyond the local campus and travel time and costs as well as registration costs were moderate. Also, the section conferences were located on local host campuses (as opposed to a national or international conference that are typically located in convention centers), an added convenience encouraging the involvement of students from the host campuses. Note that student authors could also submit regular conference papers.

The Call for Student Posters listed a broad range of potential topics. These example topics were senior or capstone design, competition (e.g., steel bridge, concrete canoe, Formula SAE, solar car, and robotics), outreach (such as Engineers without Borders), and student research projects. The poster sessions were organized as part of the regular conference planning.

B. Poster Session Challenges

The authors have seen prior attempts at encouraging student involvement in conferences. Often, these attempts had poor participation and were not sustaining. Key issues were identified during the organization of the student poster component. These issues and how they were addressed are listed below.

How can the content of posters be related to a conference with an engineering education theme?
Student engineering projects do not typically have education as a primary technical component. ASEE, however, has a long tradition of accommodating a broad spectrum of content, straddling both technical and educational objectives. As a unifying theme, the Call for Posters required submissions to address "technical accomplishments and design lessons learned." In other words, the students were to identify technical accomplishments and relate these accomplishments to engineering design practice. Note that the faculty who assign or supervise such projects have some explicit or implicit educational intent. Discussion of "design lessons learned" emphasized the engineering-applications-level results of many student projects and assisted presentations in addressing a broad audience across disciplines.

How are communication principles of audience and purpose incorporated into the session guidelines and review process?
The submission guidelines for the initial short abstract and the associated acceptance criteria emphasized that "Each accepted poster and associated two-page paper should address Technical Accomplishments and Design Lessons Learned." Note that this emphasis required students to present material differently than in the typical design report. The acceptance notifications were accompanied by the evaluation rubric and feedback comments from each reviewer. The best-poster rubric further supported effective communication techniques.

What approaches facilitate student participation?
The conference committee tried to eliminate obstacles to student participation and to provide incentives. Topical content requirements were broad, intentionally geared to incorporate reporting on student design projects, student club or team competition projects, service learning and outreach projects, as well as scholarly research efforts. A low-cost student registration rate was available. The poster submissions were encouraged as extra outlets for existing projects. Time from initial abstract submission to acceptance was kept short. The submission requirements were modest, e.g., a full paper was not required. A best-poster competition was added. The posters were added to the conference proceedings such that the students could gain a resume publication. The program schedule and physical location of the poster sessions encouraged attendee viewing.

What roles do faculty advisors have?
The faculty advisors for the projects were allowed to be secondary poster authors and to be credited with a conference publication. Faculty project advisors became invested in the posters as authors. The benefits of this arrangement were many. As authors, faculty were more likely to encourage students to submit to the poster session, to pay for student registration, to be involved in developing and revising the submission content, and to use the poster event as a

teaching opportunity in professional communication techniques. In some cases, the poster opportunity prompted greater faculty involvement in the conference and in ASEE.

The support of the ASEE section leadership greatly facilitated the success of the student activity. In addition to support through accommodations in registration, scheduling, etc., they were interested in making the student poster session an annual conference component. Since the student poster session was promoted as a potential annual activity, some regular conference attendees and section faculty advisors are expecting similar session at future conferences.

C. Communication Issues

The conference poster presentations were constrained by the length of the accompanying abstract and the space available for the posters. The venue introduced questions of "why would attendees be interested in specific work?" and "how to be complete and compelling within constrains?". To be effective, the extended abstract, as the only supporting text, had to be succinct and to support the intended poster messages in the context of the educational theme of design lessons learned. The posters did not have the support of any other available documents so they had to be complete.

Development of good communication practices are encouraged through specific guidelines for both abstracts and posters, a formal review process for abstracts, a best-poster rubric, and involvement of faculty as secondary authors. At the conference poster session, students could compare their work and posters with those of others from diverse disciplines and institutions. Also, the final extended abstract and posters are being archived in the ASEE section proceedings (available on the ASEE website [9]) so that future student presenters can look at prior abstracts and posters for examples, especially from the best-poster winners.

The poster content had to have specified elements, with the poster evaluation rubrics emphasizing effective visual and textual communication of relevant project purpose, methodology, and accomplishments, as detailed in subsequent sections. The 2013 rubrics for abstract review and final poster and extended abstract judging were developed through careful consideration of standard elements expected for various relevant national poster sessions and abstract review such as the ASEE K-12 Division 2013 Abstract Scoring Rubric [10], the NSF-Sponsored "EMU STEM Scholarship Poster Session" Rubric [11], the American Association for Agricultural Education Poster Abstract Review Form Guidelines [12], the Lilly International Conference on Teaching Poster Evaluation Rubric[13], and the "ASEE 2012 Best PIC Paper and Best Conference Paper Competitions Rubric" [14].

Conference Implementation

A. Submission Process and Requirements

The submission process and requirements are shown in Table 1. Brief initial abstracts were submitted for review. These abstracts were quickly reviewed with feedback and the authors

Table 1. Submission Process and Requirements

Deadline	**Action**	**Submission Requirements**
Approximately Eight Weeks Prior to Conference	Submission of Initial Abstract	Abstracts of 250-500 words
Approximately Seven Weeks Prior to Conference	Notification of Poster Acceptance with Evaluation Feedback	
Approximately Five Weeks Prior to Conference	One Author Registration for Conference	Student at Student Rate or Faculty Secondary Author at Regular Rate
Approximately Five Weeks Prior to Conference	Submission of Extended Abstracts & Final Poster PDF	Two-page Extended Abstract of the Poster prepared using Authors' Kit One-page PDF of Poster
At Conference*	Poster Presentation*	Poster Size Limit 45 in. x 45 in.
At Conference	Best Poster Competition	Awards announced at ASEE Section business meeting at the end of the conference
* Posters must be displayed during the poster session to appear in the archived proceedings.		

were notified of acceptance with feedback. The review guide summary is shown in Table 2. In addition to the final acceptance recommendations, each review category had a three-level rating and space for requested comments. Final posters with an associated extended abstracts were then due for inclusion in the published CD proceedings. Poster presentation attendance was required in order for the poster and extended abstract to appear in the archived proceedings.

The dates of the ASEE Section Conferences were in September. Consequently, the students finished their Spring semester projects before the initial abstracts were due. The final extended abstract and poster were due near the beginning of the students' Fall semester. Graduating students were allowed to present as long as one of the authors was registered and attended.

B. Extended Abstract, Poster, and Proceedings Content

The authors' kit for the extended abstract gave instructions for formatting and recommendations for content divisions. The suggested divisions were: Introduction, Main Headings, Technical Accomplishments, and Design Lessons Learned. Similarly for the posters, the guidelines only explicitly required significant content on "Technical Accomplishments and Design Lessons Learned."

In retrospect, these content guidelines need more detail to assist the student authors in preparing effective content. Students often struggled with how to identify the most significant technical accomplishments of their projects and how to relate those accomplishments to design practices. In the initial implementations, i.e., 2012 and 2013, the initial abstract review guide and the best-

Table 2. Initial Abstract Review Criteria.
(See Table 4 in the Appendix for the complete review rubric.)

Category	**Category Description**
Required Format	Title, Authors, Contact Included. Word Limits Met.
Writing Style	Is the abstract well-written and easy to read and understand? Is the authors' intent clear? Is the abstract focused on appropriate objectives?
Writing Mechanics	Are the grammar, spelling, and formatting appropriate for professional presentation and publication?
Topical Relevance to the Conference	Does the proposed poster content address work of interest to engineering, engineering technology, or engineering education?
Project Goals	Does the abstract clearly communication the goals or need addressed by the project?
Technical Accom-plishments & Design Lessons Learned	Does the proposed poster address "Technical Accomplishments and Design Lessons Learned" (as specified by the Call for Student Posters)?
Methodology	Does the approach or methodology seem appropriate? Does the methodology apply relevant engineering and technology practices and principles, where appropriate?
Results/Findings /Implications	Are the results clearly described? Are the results based on data or other evidences developed through the methodology?
Overall Reviewer Assessment *Accept as is* __ *Accept with minor revisions (suggested)* __ *Do not accept* __ *Accept with revision (required)* __ *Comments*	

poster rubric (see next sub-section) were not made available to students with the Call for Posters. These documents were in development. In 2013 the abstract review guide/rubric was returned with reviewer comments on the abstract for assistance in preparation of the poster and extended abstract. A needed improvement to the process is to provide student authors with both of these guides and a more-detailed content template at the outset to better communicate expectations. These resources would greatly aid in promoting the effective writing and visual design skills that the event aims to promote.

C. Best Poster Competition

A Best Poster Competition was implemented as an extra incentive and was based on both the extended abstracts and posters. The student winners were informed shortly after the poster session and they were invited to attend the awards presentation. During the first year, both undergraduates and graduate student posters were included together. During the second year, separate competitions were done.

An overview of the second-year, judging rubric for this competition is shown in Table 3. The full rubric is given in Tables 5 and 6 of the Appendix. The poster and extended abstract were weighted at 60% and 40% in the overall score. Each category had weighting as shown in the table. (On the complete review form, each category has descriptive benchmark text, cf. the Appendix.) The judges read the submitted abstract and poster prior to the session and viewed the actual posters during the session.

Assessment and Lessons Learned

Key objectives and measures of the poster components' effectiveness were student attendance and attendee interest. Did the poster session opportunity motivate students to attend? Typical student attendance in prior conferences was poor, e.g., less than ten for conferences with total attendance of over 60, and those that did attend tended to be graduate students. For the 2012 conference, 17 student posters were accepted and 16 posters were presented. The student registrations increased to 22. For the 2013 conference, 16 posters were accepted (9 undergraduate and 7 graduate) and 13 posters were presented (6 undergraduate and 7 graduate). The conference attendee evaluations included questions on the usefulness and quality of the student poster sessions. While the response rate was low, all attendees who answer these questions indicated either "outstanding" or "good."

Acceptance review of 2013 abstracts did not use a scoring system, but provided feedback on important elements within the evaluation rubric provided in Table 2 and Table 4. The judges made an overall evaluation of whether the abstract was acceptable as is, acceptable with suggested revisions, acceptable with required revisions, or not acceptable.

For graduate abstract submissions, two of six were accepted with minor revision suggested, and the remaining four accepted with required revision. Revision requests universally emphasized the need for clearer expression of goals, methodology, and specific results. For undergraduate abstract submissions, one of nine was accepted with minor revision suggested, and the remaining eight accepted with required revision. Again, required revision almost universally requested clarity of results and methodology, and usually also of goals. Undergraduate abstracts were also more likely than graduate abstracts to lack sufficient clarity of technical detail.

The best-poster judging evaluated the final performance of the students on actual posters and the extended abstract. For graduate posters in 2013, six submissions were fully reviewed and scored. (A seventh was not judged for award due to failure to meet submission requirements.)

Table 3. Overview of the Best-Poster Judging Rubric
(See Table 5 and Table 6 in the Appendix for the complete judging rubric.)

Poster Review Category	**Ranking* 0-10**	**Weighting Factor**	**Weighted Scores**
Pleasing and Professional Overall Appearance		0.50	
Logical Organization and Flow		0.30	
Meaningful Graphical/Text Communication of Content/Data		0.80	
Clear Purpose and Goals		0.50	
Topical Relevancy to the Conference		0.40	
Appropriate Methodology		0.50	
Clear Results		0.80	
Compelling Discussion/Conclusions/Recommendations		0.50	
Technical Accomplishments and Design Lessons Learned		0.80	
Overall Impression of the Poster (Judge's discretion)		0.90	
POSTER TOTALS (out of 60 possible)		6.00	
* Rankings were 0-10: 0 = Not there, 1 = Unacceptable, and 10 = Outstanding.			
Extended Abstract Review Category	**Ranking* 0-10**	**Weighting Factor**	**Weighted Scores**
Professional Writing Mechanics and Formatting		0.30	
Writing Style		0.20	
Clear Purpose and Goals		0.30	
Appropriate Methodology		0.50	
Clear Results		0.60	
Compelling Discussion/Conclusions/Recommendations		0.50	
Appropriate Reference Support		0.20	
Technical Accomplishments and Design Lessons Learned		0.40	
Content Support of the Poster		0.40	
Overall Impression of the Poster (Judge's discretion)		0.60	
ABSTRACT TOTALS (out of 40 possible)		4.00	
* Rankings were 0-10: 0 = Not there, 1 = Unacceptable, and 10 = Outstanding.			
OVERALL SCORE (out of 100 possible)		----	

Figure 1 shows the judges' scoring on the poster only and Figure 2 shows the scoring on the extended abstract (paper). The highest individual scores, the average scores of individual scores, and the lowest individual scores are noted.

Results show that there were some excellent graduate posters, and also some that struggled with appropriate content and communication. The highest quality in both the posters and the extended abstracts tended to be in the categories of topical relevancy to the conference and logical organization and flow. Lowest scores noted that as a whole, submissions (both poster and extended abstract) were particularly weak in discussion, conclusion, and recommendations. Other weak areas were in clear purpose and goals and adequate communication of methodology, and, for posters, meaningful graphical and text communication.

Overall, these limited results indicate that students did well with the mechanics of writing, but they often need assistance in identifying and clarifying the topic, aim, and methodology of their work, as well as its outcomes.

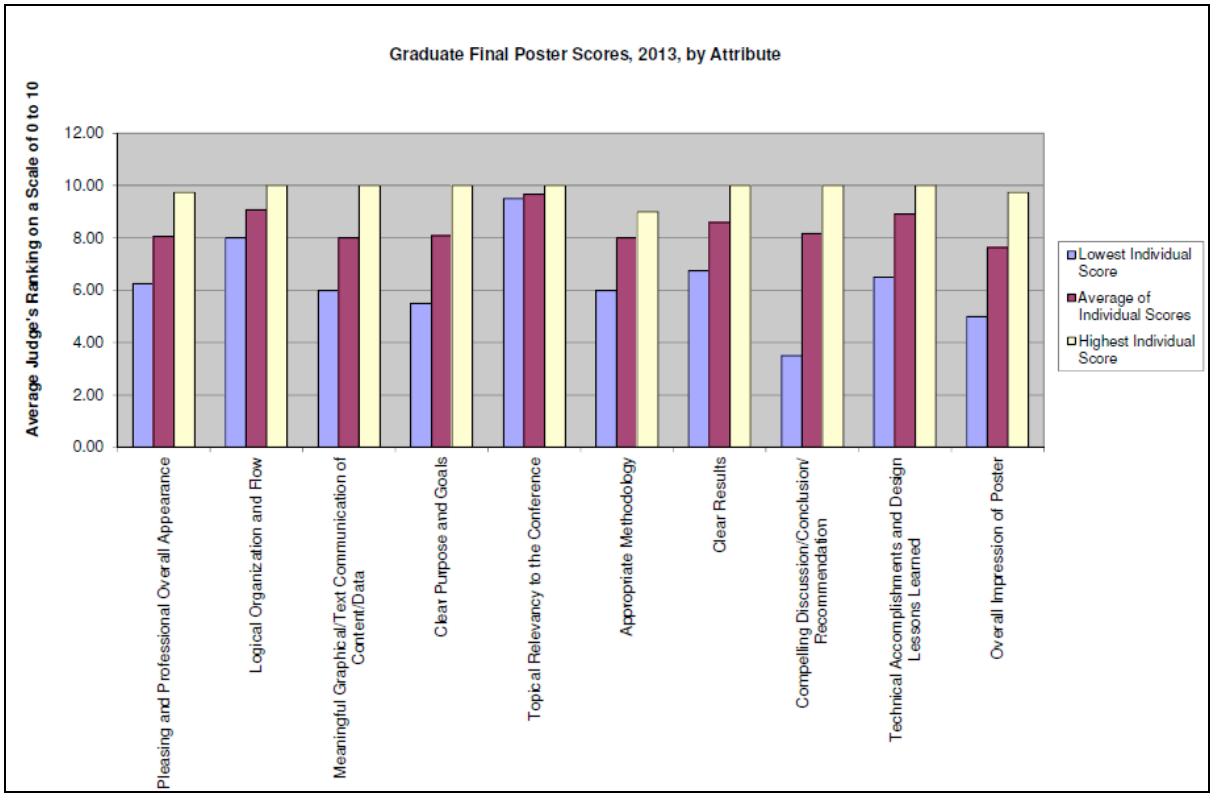

Figure 1. Graduate Poster Scores from Best-Poster Rubric

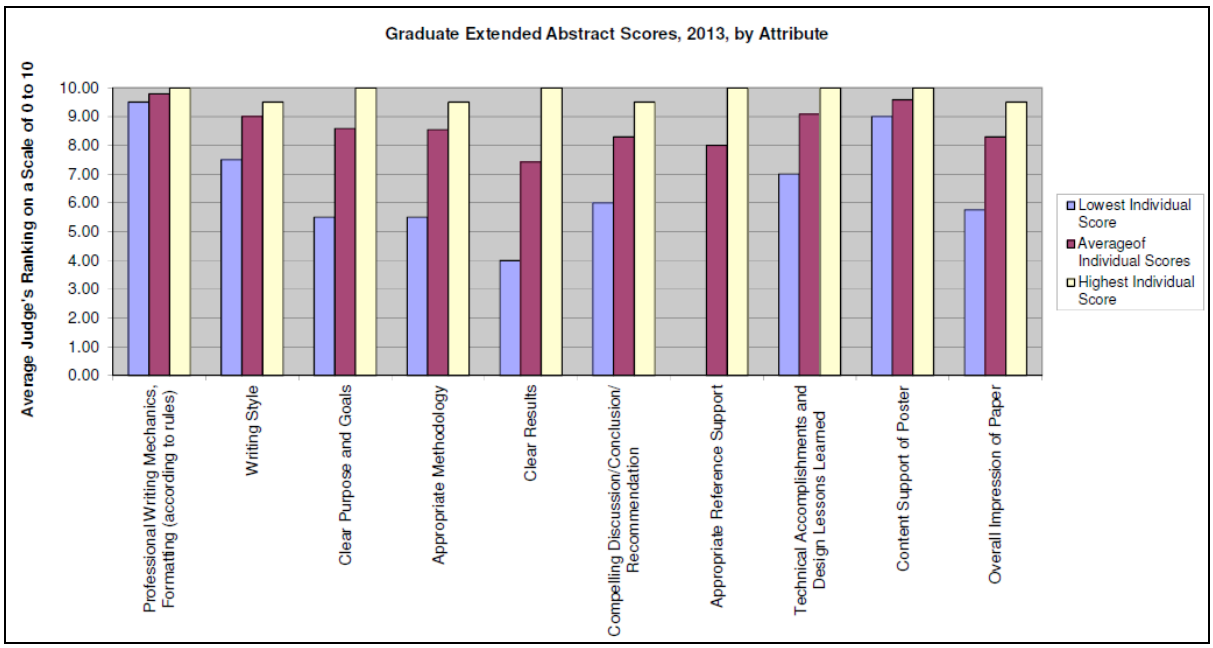

Figure 2. Graduate Extended Abstract Scores from Best-Poster Rubric

Only two of the undergraduate submissions were fully reviewed and scored for award, due student delays in meeting submission deadlines. Anecdotal observations affirm that undergraduates are unsure of audience and expectations. Technical accomplishments were often mixed in with detailed results and the significance of the project work was not clearly expressed.

Lessons learned were often rather vague and did not identify those practices that were most responsible for success and for difficulty. More guidance in these areas is needed to better meet the session objectives. It is hoped that now that scoring rubrics have been developed and tested, their publication with the Call for Papers will provide clearer guidance to student writing and poster development.

Summary and Discussion

A student poster component was added to an annual ASEE section conference and implemented in 2012 and 2013. (Due to student and faculty interest, the poster session is also planned for 2014.) The poster session requirements sought to relate the poster content to the interdisciplinary audience and education-focus by including the aspect of technical accomplishments and design lessons learned. Participation during the first two years of this event shows good effort from faculty to incorporate student participation. Sustained effort and attention is needed to make the process easy and accessible for faculty, as well as the students their students. The possibility of faculty advisors as secondary authors seemed to improve faculty interest in the activity.

One area to reconsider is the timing requirements of final student submissions. Particularly for undergraduate submissions, faculty may have difficulty contacting and prodding undergraduate students over the summer. This factor was reflected in the low number of undergraduate posters that met the deadline requirements to be considered for award in 2013. A final submission deadline after classes resume also gives the instructor more opportunity to interact with students on the quality of their final work.

Results of the judging show that even at the graduate level, engineering students still struggle with appropriately identifying and articulating important elements in their project goal, methodology, and results. Also, with regard to the technical accomplishments and design lessons components, students were often vague when identifying their most significant technical accomplishments and how to relating those accomplishments to design practices. This demonstrates the need for more local and regional opportunities like this for students to practice and learn how to effectively communicate their engineering projects and research.

It should be noted that although the abstract reviews included requests for clearer goals, methodology, and results descriptions, these continued to be weak points in the posters and extended abstracts. Our reviewer comments were not sufficient instruction, but they perhaps can point the way for more helpful interaction between students and faculty as students grapple with the significant content of their work and their audience needs in understanding it.

Results demonstrate, as expected, the need for poster session organizers to plan strategies that take the opportunity to educate students throughout the process. The Call for Papers, scoring rubrics, and reviewer comments, and interaction during the poster session should all be considered in terms of how they effectively assist student learning. Also, an abstract template, more explicit content instructions (e.g., recommended content structuring), and examples of Best Posters from prior years should assist students in developing their presentations. A challenge is to provide guidance while not being overly prescriptive. For instance, the students took many approaches to organizing their work. The categories in the "Main Headings" were left intentionally vague to facilitate the presentation of experimental results, methodology, etc. as needed by the specific student project.

One area that was discussed, but not enacted, was the possibility of requesting some sort of audience feedback or evaluation forms to be gathered as visitors to the poster session exited. Comments or scoring on individual presentations and interaction could provide helpful feedback to student presenters.

The requirement of communicating "technical accomplishments and design lessons learned" was found to be generally unifying among most types of engineering-related student projects, but did present a challenge to some excellent engineering-education oriented posters which had the purpose of improving engineering outreach to young people rather than presenting a technical application or development. These clearly presented engineering education-relevant methodology and documented results and would have made excellent paper presentations. However, the technical component to the outreach was at times extraneous to the methodology and results of the education or outreach project, and reviewers had difficulty advising the authors

on how to better meet the "technical accomplishments" requirement. Future conference committees might consider whether it might be appropriate (and yet not too confusing) to broaden the accepted poster content to include either technical accomplishments or "clear design methodology and results of an engineering education or outreach project."

The ASEE section conference has proven to be a reachable and effective venue for engaging engineering students in the experience of presenting their work at a poster session event beyond their campus. Procedures, event announcements, and scoring rubrics have been developed and tested. These are available for adoption and improvement by future conference organizers and for instruction to students seeking to learn and improve written and visual communication skills.

Acknowledgements

Support from the section officers and the conference committee for the ASEE Midwest Section is acknowledged.

Appendix: Benchmarks for Best-Poster Rubric

The complete forms for evaluation of initial abstracts, extended abstracts, and the final posters are shown in Table 4, Table 5, and Table 6, respectively.

Table 4. Abstract Rubric for Best-Poster

Student Poster Abstract Evaluation Feedback Form			
	Good	***Room for some improvement***	***Significant Improvement Needed***
Writing Style Is the abstract well-written and **easy to read and understand**? Is the authors' **intent clear**? Is the abstract **focused on appropriate objectives**?	The abstract is very well written. It is **easy to read and to understand the authors' intent**, which is **focused on its topic and objectives**.	Some sections are difficult to read or to understand. The content could be better structured or more clearly explained. Focus may seem to shift.	It is difficult to read and/or to understand the authors' goal and intent. Focus may seem unclear.
Writing Mechanics Are the grammar, spelling, and formatting **appropriate for professional presentation and publication**?	Writing is near perfect with **little or no grammar, spelling, or formatting errors**.	Some grammar or spelling errors **detract from the professionalism of the presentation** and require editing.	Significant grammar or spelling errors make **reading difficult and/or clarity uncertain**. Requires editing assistance.
Topical Relevance to Conference Does the proposed poster content address work of interest to **engineering, engineering technology, or engineering education**?	The proposed content **seems appropriate** to the interests of **engineering, engineering technology, or engineering education.**	Relation to the interests of engineering, engineering technology, or engineering education seems there, but **could be more clearly emphasized**.	Relation to the interests of engineering, engineering technology, or engineering education **seems unclear.**
Goals Does the abstract clearly communicate the **goals or need** addressed by the project?	The project **goals and their relevance are clear and persuasive**.	The project goals and/or their relevance are somewhat described, but **could be clearer or more persuasively presented**.	The goals of the described project and/or their relevance are **unclear**.
Technical Accomplishments and Design Lessons Learned Does the proposed poster and paper address "Technical accomplishments and design lessons learned" (as specified in the Call for Student Posters)?	The proposed content **emphasizes technical accomplishments and design lessons learned**.	The proposed content **mentions or suggests** technical accomplishments and/or design lessons learned. This **could be better-emphasized**.	Technical accomplishments and/or design lessons learned are left **unclear**. This content is REQUIRED for Student Posters and the two-page paper.
Methodology Does the approach or methodology seem **appropriate**? Does the methodology apply **relevant engineering & technology practices and principles**, where appropriate?	The abstract describes (or briefly mentions) a **methodology that seems appropriate to the goals** and **grounded in relevant engineering and technology principles and practices** (where appropriate).	The methodology description and/or its basis in engineering and technology principles and practices **could use some clarification**.	Methods seem **inadequately described, unclear, inappropriate, or lacking in expected engineering and technology practices**.
Results/Findings/Implications Does the abstract **clearly indicate appropriate results**? Are the results **based on data or other evidences** developed through the methodology?	Results are **clearly indicated and seem supported by evidence**, or inconclusive findings are clearly described with appropriate conclusions and next-step recommendations.	Some results are indicated, but may **be sketchy, too-briefly described**, or **lacking in evidence-based support**.	Results are **unclear or unsupported**.
Overall Reviewer Assessment: *(An "X" in the colored box indicates the reviewer recommendation.)*			
The abstract should be **accepted as-is**.	The abstract should be **accepted with minor revision suggested**.	The abstract can be **accepted with revision required.**	The abstract is **not accepted** for this conference venue.
Reviewer Comments:			

Table 5. Best-Poster Rubric Scoresheet for Final Poster

Student Poster and Extended Abstract Judging Form		**Page 1 of 2**		
Poster Review	*Benchmarks*	*Judges Ranking on a scale of 0-10: 0=not there 1=unacceptable 10=outstanding*	*Weighting Factor*	*Weighted Scores*
Pleasing and Professional Overall Appearance	The poster **pleasing to look at**, uncluttered, with good visual balance of text, graphics, white space, and color choices. Text is **free of grammarical and spelling errors**.		0.50	
Logical Organization and Flow	The audience can easily determine how to move through the poster in a meaningful manner.		0.30	
Meaningful Graphical/Text Communication of Content/Data	**Graphics assist in providing meaningful communication** of relevant content and data. **Enough text is used to explain the graphics**. (The audience is not left to guess the point of the graphic.) **Writing style** is clear and understandable.		0.80	
Clear Purpose and Goals	Project goals and their relevance clearly and persuasively communicated. The audience is clear what the project attempted to accomplish.		0.50	
Topical Relevancy to the Conference	The content of the paper/poster appropriate to the interests of engineering, engineering technology, or engineering education.		0.40	
Appropriate Methodology	An appropriate approach or methodology is clearly communicated. The methodology applies relevant engineering & technology practices and principles, where appropriate.		0.50	
Clear Results	The poster clearly indicates appropriate results. **Results are based on data or other evidences** developed through the methodology.		0.80	
Compelling Discussion/Conclusion /Recommendation	The poster **communicates a relevant, accurate, and compelling interpretation of findings, conclusions**, implications, next-step recommendations, or other relevant discussion.		0.50	
Technical Accomplishments and Design Lessons Learned	The content communicates "technical accomplishments and design lessons learned."		0.80	
Overall Impression of Poster	(Judge's discretion)		0.90	
		Totals: of 60 Possible	6.00	

Table 6. Best-Poster Rubric Scoresheet for Extended Abstract

Student Poster and Extended Abstract Judging Form		**Page 2 of 2**		
Extended Abstract Review	Benchmarks	*Judges Ranking on a scale of 0-10: 0=not there 1=unacceptable 10=outstanding*	*Weighting Factor*	*Weighted Scores*
Professional Writing Mechanics and Formatting (according to rules)	Grammar, spelling, and formatting are **appropriate for professional presentation and publication**. Formatting includes: Margins, Times-Roman fonts, spacing between headings and paragraphs, single-spaced. **All figures have captions and are referenced within the text**.		0.30	
Writing Style	The paper well-written and easy to read and understand. The authors' intent is clear. The paper is focused on appropriate objectives; focus does not seem to shift.		0.20	
Clear Purpose and Goals	Project goals and their relevance clearly and persuasively communicated.		0.30	
Appropriate Methodology	The approach or methodology seems appropriate. The methodology applies relevant engineering & technology practices and principles, where appropriate.		0.50	
Clear Results	The paper clearly indicates appropriate results. **Results are based on data or other evidences** developed through the methodology. Inconclusive findings are clearly described with appropriate conclusions and next-step recommendations.		0.60	
Compelling Discussion /Conclusion /Recommendation	The paper **communicates an accurate, relevant and compelling interpretation of findings, conclusions**, implications, next-step recommendations, or other relevant discussion.		0.50	
Appropriate Reference Support	The paper/project makes use of references appropriate for this type of project and paper content.		0.20	
Technical Accomplishments and Design Lessons Learned	The content communicates "technical accomplishments and design lessons learned."		0.40	
Content Support of Poster	The content of the paper is appropriately linked with and supporting poster content.		0.40	
Overall Impression of Paper	(Judge's discretion)		0.60	
		Totals: of 40 Possible	4.00	
		Overall Score (Poster + Paper Score):		

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