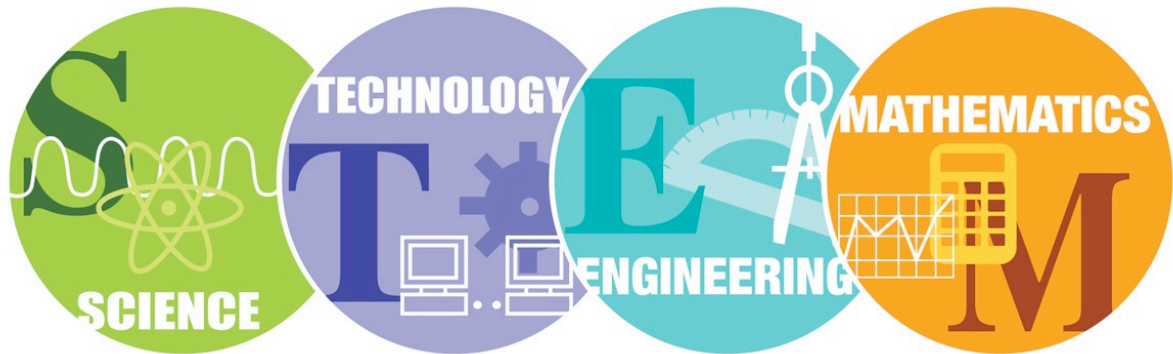


**2011**



Northwest Ohio Symposium on Science, Technology, Engineering, and Mathematics Teaching

# **Evaluation Report**

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## INTRODUCTION

The Northwest Ohio Symposium on Science, Mathematics, and Technology Teaching (hereafter referred to as the NWO Symposium) is a regional conference for STEM educators in Northwest Ohio. On November 5, 2011, the Northwest Ohio Center for Excellence in STEM Education (NWO) held its annual NWO Symposium at Penta Career Center in Rossford, Ohio. The purpose of this report is to describe the evaluation of the 2011 NWO Symposium. The report will begin with a description of the NWO Symposium, including the methods used to evaluate it as well as the characteristics of the vendors and session presentations. The report will then describe the evaluation findings before making general conclusions and recommendations for future events.

## 2011 NWO SYMPOSIUM

The 2011 NWO Symposium was held November 5, 2011 at Penta Career Center in Rossford, Ohio. The Symposium began at 8:00 A.M. and concluded at 4:00 P.M. Lunch was served from 11:00 A.M. to 1:00 P.M., and refreshments were provided in the afternoon. The vendor area, which included 21 exhibits, was open to the attendees during the two-hour lunch period.

There were a total of 267 participants in attendance at the 2011 NWO Symposium. Table 1 displays a detailed summary of the attendance at the 2011 NWO Symposium as well the attendance numbers from the previous two Symposia.

**Table 1. NWO Symposium attendance from 2009 to 2011**

Participants	2009 NWO Symposium	2010 NWO Symposium	2011 NWO Symposium
Attendees			
PK-12 Teacher	238	85	118
Pre-service Teacher	157	58	41
Higher Ed. Faculty	25	10	9
School Administrator	5	4	2
Other	16	11	4
Total Attendees	441	168	174
Presenters & Vendors	127	141	81
NWO Staff & Volunteers	20	13	12
<b>TOTAL</b>	<b>588</b>	<b>322</b>	<b>267</b>

As demonstrated in the table above, the total attendance at the 2011 NWO Symposium was 17% lower than the attendance at the 2010 Symposium. However, the decrease in total attendance is solely due to the significantly lower number of presenters and vendors. There were 42% fewer presenters and vendors at the 2011 Symposium than were at the 2010 Symposium. This decrease was intentional, as far fewer sessions were offered in 2011 than in past years, which therefore required fewer presenters to participate. Nevertheless, while the number of presenters and vendors decreased in 2011, the number of attendees slightly increased from 168 total attendees in 2010 to 174 total attendees in 2011. As expected, the majority of attendees in 2011 were preK-12 teachers, most of whom were middle school (grades 5-8) teachers who taught either science or mathematics. About half of the teachers taught middle grades, while a quarter of the teachers taught elementary grades and another quarter of the teachers taught high school.

Although many of the attendees at the 2011 NWO Symposium had attended in previous years, most were attending for the first time. About half of the attendees (not presenters and vendors) reported that 2011 was their first year attending the NWO Symposium. Another 15% reported that 2011 was their second year attending the NWO Symposium. Many of the presenters and vendors (who completed the evaluation survey) were also participating for the first time in 2011 – almost 30% reported that 2011 was their first year participating in the Symposium. However, a majority of the presenters and vendors (35%) reported that they had been participating in the NWO Symposium for more than five years. Most (51%) had participated in previous NWO Symposia as presenters, while some also previously participated as vendors (20%), or as attendees only (35%). According to the results of the evaluation survey, most of the presenters and vendors were preK-12 teachers, college or university faculty, or non-profit educational institutions.

Participants who completed the online evaluation surveys reported learning about the 2011 NWO Symposium in several ways, but most reported learning about the Symposium by e-mail or from a colleague. Table 2 shows the percentage of participants who reported learning about the Symposium by each of the eight methods listed on the surveys.

**Table 2. Methods by which participants learned about the 2011 NWO Symposium**

Method	Percentage of Participants (n = 172)
E-mail message from NWO/COSMOS	58.7% (101)
Told by a friend or colleague	23.3% (40)
NWO Inquiry Series	12.8% (22)
College course	12.2% (21)
NWO newsletter	12.2% (21)
Flyer	11.6% (20)
OSLN (Ohio STEM Learning Network) website	3.5% (6)
NWO Resource Center	3.5% (6)

The attendees gave several reasons for attending the 2011 NWO Symposium, the three most common reasons being previous experience with the NWO Symposium and NWO Inquiry Series, the variety of the sessions, and grant project or course requirements. When asked what they were hoping to learn or acquire at the 2011 NWO Symposium, most attendees responded that they wanted new ideas and resources (e.g., for their classroom), and many expected to learn about the new science and mathematics standards. For the presenters and vendors, the most common reason for participating in the Symposium was to share their work (e.g., classroom activities, organizational programs, research) with other educators in the region.

A total of 49 sessions and a keynote address by Dr. Gene Poor were offered during the NWO Symposium, with about 12 sessions being offered every hour. Six were “double sessions”, meaning they lasted for two hours instead of one. Most of the sessions were fairly well attended, with attendance ranging from 2 to 37 and an average attendance of 12. Most of the sessions were interdisciplinary in nature, meaning they addressed multiple STEM disciplines and/or included non-STEM disciplines, but there were also many science, mathematics, and technology sessions as well. Table 3 shows the number of sessions that addressed each area of STEM education, as well as an example of a session from each.

**Table 3. Content addressed by sessions at the 2011 NWO Symposium**

Content Area	Session Examples	Number and Percentage of Sessions (n = 49)
Interdisciplinary	“You’re Never Too Old for Picture Books”	39% (19)
Science	“Bringing CSI into the Classroom”	33% (16)
Mathematics	“Mathematics in the Media”	14% (7)
Technology	“Digital Creations for Primary Grades”	12% (6)
Engineering	“Putting the ‘E’ in STEM Teacher Preparation”	2% (1)

### **Changes in the Implementation of the NWO Symposium**

There were several changes made to the design and implementation of the 2011 NWO Symposium in response to participant and staff feedback about the 2010 NWO Symposium. The major changes are outlined below:

1. A keynote address was included in the Symposium after lunch from 1:00 PM to 1:50 PM. A keynote session had typically been included in past events, but was not included in the 2010 Symposium.
2. The number of sessions offered during the event was drastically reduced from the 2010 Symposium. This change was effective in increasing the per session attendance, which, due to the large number of available sessions per hour, was significantly lower in 2010.
3. Sessions were not offered during the lunch/vendor period in order to provide attendees time to browse the exhibits. In addition, most vendors did not stay at the Symposium for the entire day, but rather came an hour before the lunch/vendor period, and left an hour later.
4. A new session labeling system was implemented in order to help participants decide what sessions to attend. The new system labels each session as Science, Mathematics, Engineering, Technology, or Interdisciplinary. Presenters were asked to choose only one of the labels to represent the content addressed during their session. Also, as in the past, grade levels were assigned to each session.

## **Evaluation of the 2011 NWO Symposium**

The purposes of the evaluation were to: (1) determine the quality and impact of the NWO Symposium, primarily indicated by the participants' perceptions regarding the value and usefulness of the Symposium, (2) document changes made to the 2011 event, and determine the impact of those changes on the quality of the NWO Symposium, and (3) identify ways in which future NWO Symposia might be improved. These purposes were accomplished by analyzing data from the session evaluation surveys, attendee evaluation survey, and presenter and vendor evaluation surveys.

The session evaluation survey consisted of five statements about the session (e.g., “the session was engaging”, “I learned something new from the session”), to which the participants rated their level of agreement by circling Disagree, Somewhat Disagree, Somewhat Agree, or Agree. The survey also provided participants an opportunity to offer comments about the session and/or presenter. The attendees were asked to complete one survey for each session they attended. Six surveys – one for each session and the keynote – were provided to the attendees in an envelope at registration. Attendees were asked to complete the surveys, put them back in the envelope, and return the envelope at the end of the day. Most of the attendees completed an evaluation for the sessions they attended. The average response rate (number of completed evaluations/number of attendees) for all of the sessions was 84%.

The attendee evaluation survey was administered online and consisted of 24 items regarding the attendees' demographic information (e.g., professional status, teaching information) and perceptions of the 2011 NWO Symposium. The attendees' perceptions of the Symposium sessions were measured with five items measured on a four-point Likert scale with - 2 = Disagree, - 1 = Somewhat Disagree, 1 = Somewhat Agree, and 2 = Agree. This scale allows for practical interpretations of the results, since 0 indicates a “neutral” attitude, positive numbers indicate a positive attitude and negative numbers indicate a negative attitude. Sample items include, “The sessions I attended were engaging” and “I will incorporate the information/resources from the Symposium into my professional practices (e.g., teaching, administration, etc.)”. The attendees were also asked to rate the vendors, food, program book and venue using a four-point Likert scale with 1=Poor, 2=Average, 3=Good, and 4=Excellent. The survey also included several open-ended items to solicit attendees' comments and suggestions

about the NWO Symposium. A total of 121 attendees completed the survey, and therefore the overall response rate for the attendee evaluation survey was 70%.

The presenter and vendor evaluation survey was administered online and consisted of 14 to 18 items (depending on the whether the respondent was a presenter, vendor, or both) regarding the presenters’ and vendors’ perceptions about the success of the NWO Symposium, and the overall quality of the NWO Symposium. The items regarding the participants’ perceptions were mostly open-ended. The items regarding the overall quality of the NWO Symposium were measured on a four-point Likert scale with 1=Poor, 2=Average, 3=Good, 4=Excellent. The survey also included several open-ended items to solicit the presenters’ and vendors’ comments and suggestions about the NWO Symposium. A total of 51 presenters and vendors completed the survey, and therefore the overall response rate for the presenter and vendor survey was 63%.

## **PERCEPTIONS OF THE 2010 NWO SYMPOSIUM**

### **Attendee Perceptions**

Overall, the responses on the session evaluation surveys indicated that attendees perceived the sessions to be engaging and valuable. Table 4 shows the average score for each item on the survey when all of the sessions are taken together.

**Table 4. Attendees’ average responses on the session evaluation surveys**

Survey Item	Average Score
The session was engaging	1.37
The information presented during the session was relevant and applicable to my professional practice	1.45
I learned something new from the session	1.54
The educational community would benefit from knowing the information presented during the session	1.55
The session label in the program book (e.g., science, technology, interdisciplinary) accurately represented the session content.	1.64
<b>Total</b>	<b>1.51</b>

Note: - 2 = Disagree, - 1 = Somewhat Disagree, 1 = Somewhat Agree, 2 = Agree

Individually, the sessions received positive responses from the attendees. All of the sessions had an average evaluation score greater than zero (indicating a generally positive

attitude toward the session), and all but eight sessions had an average evaluation score greater than one. Moreover, of all the 605 individual session surveys collected during the Symposium, only 29 had an average score less than zero, which means that most individual evaluation surveys reflected an overall positive session experience.

The responses to the online evaluation survey also indicated that the attendees perceived the 2011 NWO Symposium to be a high-quality professional development experience. Table 5 shows the responses to some of the items on the survey.

**Table 5. Attendees' responses on the online evaluation survey**

Survey Item	Responses (n=116)				Average Score
	Disagree (- 2)	Somewhat Disagree (- 1)	Somewhat Agree (1)	Agree (2)	
The sessions I attended were engaging	0% (0)	7% (8)	39% (45)	54% (63)	1.40
The information presented during the Symposium was important to me	1% (1)	5% (6)	38% (44)	56% (65)	1.43
I will incorporate the information/resources from the Symposium into my professional practices (e.g., teaching, administration, etc.)	0% (0)	5% (6)	40% (46)	55% (64)	1.45
I learned something new from the sessions I attended	1% (1)	6% (7)	25% (29)	68% (79)	1.53
As a result of the NWO Symposium, I feel more excited about the teaching and learning of science, math, and/or technology	1% (1)	6% (7)	40% (46)	53% (62)	1.39

Attendees also ranked the 2011 NWO Symposium on several factors, including the vendor exhibits, the program book, the food, the venue, and the NWO Symposium overall. The responses to these items are shown in Table 6. In general, attendees rated the 2011 NWO Symposium lower than past events, particularly regarding the food and the overall event.



**Table 6. Attendees' perceptions of several aspects of the 2011 NWO Symposium**

Survey Item	2011 Responses (n=115)				Average Score 2011	Average Score 2010*	Average Score 2009**
	Poor	Average	Good	Excellent			
Vendor Exhibits	8% (9)	37% (42)	44% (51)	11% (13)	2.6	2.8	3.0
Program Book	0% (0)	15% (17)	44% (51)	41% (47)	3.3	3.6	3.6
Food	24% (28)	29% (33)	31% (36)	16% (18)	2.3	2.9	3.6
Venue	1% (1)	10% (11)	25% (29)	64% (74)	3.5	3.7	3.8
Overall	2% (2)	21% (24)	50% (57)	28% (32)	3.0	3.5	3.6

Note: 1=Poor, 2=Average, 3=Good, 4=Excellent

\* From the 2010 NWO Symposium Evaluation Survey (n=114)

\*\* From the 2009 NWO Symposium Evaluation Survey (n=394)

The attendees' qualitative responses help explain the lower ratings. The most salient theme throughout the attendees' responses was their displeasure with the food. While a few attendees gave positive comments about the food, most of the comments were negative. The attendees suggested that more choices be made available, and pointed out that there was not a vegetarian option. Some of the attendees also suggested that a small breakfast be provided in the morning. This is the second consecutive year that food has been poorly rated by the attendees at the NWO Symposium. NWO staff should consider the ratings and comments given by attendees regarding the food when planning future Symposia.

Another common theme among the attendees' responses was the length of the lunch/vendor break, which the attendees perceived to be too long. This year, a two-hour break was provided for attendees to eat lunch and browse the vendor exhibits. Many attendees felt like the extra time was a waste of time, and could have been used to provide another session, or decrease the overall length of the Symposium. Some of the attendees wrote:

*I thought we had too much time for lunch and it wasted time.*

*There was way too much time at lunch. That could have definitely been shortened and we could left an hour earlier.*

*I think 2 hours for lunch and then an hour speaker is what caused a lot of use to leave as soon as we ate. Many people visited the vendors and then ate and by the time we were done eating we still had an hour and a half until the speaker.*

The last comment is particularly important because it points to an attendance issue that was common for the 2011 Symposium. Upon analysis of the session evaluation surveys, it was discovered that many attendees only completed surveys for the first three sessions, which could be interpreted to mean that many of the attendees left the Symposium early. The last comment above indicates the long lunch break may have been responsible for the attendees leaving early. A few other attendees also speculated that the long break may have cause some people to leave. This brings up two issues that should be addressed in the future. First, the break should be reduced to one hour. Second, a system should be developed to keep track of how long attendees stay at the Symposium.

The attendees may have also rated the Symposium lower than in the past due to what they perceived as deficiencies in the Symposium sessions. Many attendees reported that they were disappointed in the relative lack of sessions about the new science and mathematics standards, and several attendees wanted sessions about math. (This finding wasn't unexpected; a call for more math session has been consistent the past few years.)

It is important to note that even though the overall rating for the 2011 Symposium is lower than in the past, it is still a "Good" rating (i.e., the average rating of 3.0 equates to "Good" on the rating scale). Many of the comments revealed that the 2011 Symposium was a valuable learning experience that provided applicable information and resources for those who attended. Several attendees positively commented that the presenters were well prepared, enthusiastic, and knowledgeable, and several others commented on the wide variety of sessions that were available to choose from.

When asked if they would attend again, most attendees (80%) reported they would be very or moderately likely to attend next year, and 18% reported they would be a little likely to attend next year. Only 3% reported they would be not at all likely to attend next year.

### **Presenter and Vendor Perceptions**

Most of the online presenter and vendor survey respondents participated in the 2011 NWO Symposium as presenters (80%), while a smaller percentage participated as vendors (10%) and both presenters and vendors (10%). Overall, the presenters as vendors perceived their participation to be worthwhile. Most of the participants reported that their participation was either definitely (69%) or moderately (26%) worthwhile. Two respondents (4%) reported that

their participation was very slightly worthwhile, and only one participant (2%) reported that his/her participation was not at all worthwhile. Most of participants who reported that their participation was worthwhile provided an explanation that had something to do with the number and receptivity of the teachers at their session/exhibit. Those who reported low attendance or limited interaction at their session/exhibit tended to rate their experience as less worthwhile than those with high attendance and interaction.

The respondents were asked to rank the 2011 NWO Symposium on several factors, including organization of the event, room set-up (for presenters), exhibit space (for vendors), available technology, volunteer assistance, the venue, the food, the Symposium staff, and the Symposium overall. The results from these items are shown below in Table 7. The responses to these items indicate a positive overall experience. However, several of the presenters and vendors negatively commented about the quality and lack of choices regarding the food.

**Table 7. Presenter and vendor perceptions of several aspects of the 2011 NWO Symposium**

Survey Item	n	Responses					Average Score 2011	Average Score 2010
		Poor	Average	Good	Excellent	N/A		
Organization	47	2% (1)	2% (1)	23% (11)	72% (34)	0% (0)	3.7	3.8
Room Set-up	46	4% (2)	0% (0)	20% (9)	67% (31)	9% (4)	3.6	3.5
Exhibit Space	45	0% (0)	9% (4)	22% (10)	40% (18)	29% (13)	3.4	3.4
Available Technology	46	2% (1)	2% (1)	28% (13)	63% (29)	4% (2)	3.6	3.6
Volunteer Assistance	47	0% (0)	2% (1)	26% (12)	64% (30)	8% (4)	3.7	3.6
Venue	48	0% (0)	0% (0)	21% (10)	79% (38)	0% (0)	3.8	3.9
Food	47	15% (7)	13% (6)	19% (9)	21% (10)	32% (15)	2.7	3.0
Staff	47	0% (0)	0% (0)	17% (8)	79% (37)	4% (2)	3.8	3.8
Overall	47	2% (1)	4% (2)	30% (14)	62% (29)	2% (1)	3.5	3.6

Note: 1=Poor, 2=Average, 3=Good, 4=Excellent

The presenters and vendors were also asked to comment about the success of their sessions and/or exhibit. Most of the presenters and vendors perceived their sessions/exhibits to be successful based on the attendance at their session/exhibit, attendees' engagement and interest in their activities/exhibit and the verbal feedback they received from the attendees.

When asked about their participation in next year's NWO Symposium, most presenters and vendors reported they would either be very likely (62%) or moderately likely (31%) to participate. Only 6% reported that they would be a little likely to participate, and no one reported that they would be not at all likely to participate.

## **CONCLUSIONS**

The overall perception of the 2011 NWO Symposium was positive. Attendees perceived the event to be valuable and applicable to their professional practice, and presenters and vendors perceived the event to be a valuable and appreciated opportunity to share their work. The individual sessions were rated highly by the attendees, and the keynote address received many positive comments. Most of the changes made in 2011 resulted in a better overall experience for participants at the Symposium. The decrease in the number of sessions resulted in a higher per session attendance, which likely created a more interactive and discussion-friendly learning environment for each session. The reinstatement of the keynote address provided a motivational message that may have helped to create a more positive and hopeful environment. And while the explicit break for lunch and vendor browsing was a needed change, the time provided was too long. Combined with a poorly received lunch, this break may have put a bitter taste in the mouths of some attendees, causing them to leave the event early. If the NWO Symposium is to improve in the future, the NWO staff needs to create an overall positive learning environment, where attendees feel like their money and time is being used well.

## **SUGGESTIONS FOR FUTURE NWO SYMPOSIA**

The following suggestions for future NWO Symposia are made based on the comments and suggestions of the 2011 NWO Symposium participants as well as the observations of the evaluator and NWO staff.

### **1. Reorganize the timeline of the Symposium.**

One of the most common attendee comments was that the lunch/vendor time was too long, and many suggested that it be shortened so another session could be added to the day or so the Symposium could end an hour earlier. The vendors appreciated the time, and commented that the lunch format this year was better than last year. Current and past evaluation results

indicate that it is important to provide some time explicitly for lunch and vendor browsing, but according to the attendees, two hours is too much. It is suggested that the time be reduced to one hour. In addition, it is suggested that the keynote address be moved to the beginning of the day. Short announcements followed by the keynote address first thing in the morning would likely provide a sense of community and offer motivation for learning during the remainder of the Symposium.

## **2. Offer different food choices than what was offered for the 2011 NWO Symposium.**

The most salient theme among the participants' comments was their disappointment with the food that was offered at the 2011 Symposium. It is suggested that more choices be offered during lunch (including healthy options such as fruit and vegetables), and that a vegetarian option be provided as well. In addition, a small breakfast could be offered in the morning. While improving the food may result in a higher cost to run the Symposium, attendees will appreciate the improvement, and will likely have a more positive overall experience at the Symposium as a result. This is the second consecutive year that the food has been poorly rated.

## **3. Design a system for keeping track of how long each attendee stays at the Symposium.**

Many attendees left the 2011 Symposium early, likely due in part to the long lunch/vendor break in the middle of the day. One problem with attendees leaving early is that the NWO staff does not know who left early and who stayed for the duration of the Symposium. Therefore, when attendees request a contact hours certificate, eight hours are awarded to everyone, even though those who left early should be awarded less. The NWO staff should work to develop a tracking system before the next Symposium.

## **4. Offer more mathematics and technology sessions, as well as sessions that focus on the new Ohio standards.**

This suggestion is based on the attendees' responses to the following question: What educational issues/topics would be beneficial to address at the NWO Symposium next year? The most common responses were mathematics, technology integration, and the new science

and mathematics standards. This year, a new session labeling system was used, whereby sessions were labeled as interdisciplinary, science, technology, engineering, or mathematics. Most sessions were interdisciplinary in nature, but there were still double the number of science-only sessions than there were math-only or technology-only sessions. Some of the interdisciplinary sessions did focus more on mathematics or technology, and therefore the overall coverage of mathematics and technology concepts is higher than what the numbers imply. Nevertheless, an effort should be made to increase the number of math-only and technology-only sessions in the future.