

Youth Engagement in Energy Efficiency as a Vehicle for Behavioral Change

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ABSTRACT

Students regularly engage in fundraising to acquire resources for their school, typically through the sale of items such as magazines and candy bars. By reconfiguring the fundraising model around the message of energy efficiency, students become an effective voice in spreading that message in their community.

In order to meet school fundraising needs while modifying local behaviors to reduce energy usage, a K-12 program was developed and has been operating for the past five years. The program presents schools with a fundraising opportunity through the sales of energy-efficient products. Participating students receive informative presentations from program staff, with accompanying lesson plans and activities. The primary function of the program is to motivate students to consider energy usage in their day-to-day behavior. Likewise, successful fundraising requires that students effectively spread this message in their community as a means of achieving sales.

This program, which has reached over 5,000 students and has achieved estimated energy savings of 32,000 MWh, capitalizes on social networks to gain an audience for efficiency where media-based marketing falls short, using dinner-table conversation and social relationships as avenues of communication. Program strategy has evolved to amplify the positive effects of the program through:

- Inter/Intra-school competition
- Community service / Moral obligation
- Peer approval and public recognition
- Student creativity
- Social networking

The lessons learned through this program provide strategies which can be broadly applied to squeeze added energy savings out of existing program models by taking advantage of the social aspects of program design.

Program Rationale

The role of youth participation in energy efficiency programs is often overlooked and underutilized in delivering consumer energy savings. While it is true that adults typically make the majority of purchasing decisions that affect energy usage in the household, youth can play a significant part in influencing these purchasing decisions. In one case, an initiative to reduce greenhouse gas emissions amongst K-8 students not only gained purchase with participating students, but had the secondary effect of eliciting similar behavioral changes in more than 50% of parents, who reported the campaign as “very influential” (Freeman & Skumatz 2009).

Likewise, the energy use behavior of minors is malleable and can be influenced before their energy-inefficient behaviors become fossilized. A recent Stanford study determined that

high school students taught a targeted behavior change curriculum demonstrated an almost 30% increase in energy-efficient behaviors (Cornelius, Robinson & Hoffman 2009). Still, youth are disregarded or marginalized in many efficiency program portfolios because at least a portion of their contribution to efficiency savings may be delayed for years, at which point both attribution and quantification of savings become difficult. Nevertheless, engaging youth in energy efficiency is a prudent decision for program administrators taking the long view. Like many energy efficiency opportunities, an investment early on may pay steady dividends over a lifetime.

It was with this thinking that the Midwest Energy Efficiency Alliance (MEEA) sought to develop a new program that would focus primarily on students by encouraging them to adopt energy efficiency as a part of their lives. At the same time, this program would provide these students with the tools needed to influence their communities in this same direction. The resulting program, Lights for Learning™, was developed in 2004 through collaboration between, MEEA, the Illinois Department of Commerce and Economic Opportunity (DCEO), Applied Proactive Technologies (APT), and Portland Energy Conservation, Inc (PECI). Originally, the program was established as the educational component of a broader statewide residential lighting effort, and eventually established itself as a separate program with independent funding. Lights for Learning was conceived around a core concept of making energy efficiency curriculum and presentations available to students while addressing schools' need for school fundraising opportunities. In the ensuing years, Lights for Learning has grown to become a statewide, annual initiative in Illinois and MEEA's experiences in administering the program has taught us much on how to incorporate energy efficiency into the understanding and behavior of students.

Program Framework

The Lights for Learning program is a unique environmental education program that provides a platform for educating students, teachers, and the community on energy efficiency and its benefits. The program's delivery to each participant is highly flexible, providing schools with a slate of resources that they may draw upon to bring energy awareness into their curriculum.

The educational core of the program takes various forms, all centered around the goal of educating students and teachers on the rationale behind adopting energy efficiency through the energy-consuming devices we use, and the ways in which we use them. A kick-off assembly is available to all schools wishing to receive it. Lights for Learning's presenters are current and former educators with experience in working with students, and are trained by tenured program staff to give presentations that are fun, informative, and interactive. These talks engage and inform students on a broad range of energy issues such as generation and fuel sources, greenhouse gases, home energy efficiency and conservation, and the ENERGY STAR® program.

Lights for Learning provides supplemental materials to students and teachers in order to build upon the initial assembly by integrating efficiency education into the classroom. Lesson plans are made available to teachers detailing up to a week's worth of lessons. Due to the wide variety of fundraising groups, these lesson plans are not only age appropriate, but are tailored to specific subjects (e.g., efficiency vocabulary for an English class, or kilowatt-hour calculations for mathematics). The teacher materials are supplemented with Activity Booklets that are also grade appropriate, and provide additional efficiency education elements that are embedded in fun activities such as crossword puzzles and energy efficiency trivia.

As a means to ease entry into schools, a fundraising component was integrated into the program. Fundraising in schools is highly prevalent as a means of making up budgeting shortfalls. Fundraising accounts for \$2 billion in additional school resources provided by student efforts, and is utilized by 94% of American elementary schools (Cox Gurdon 2008). The fundraising portion of Lights for Learning typically follows the in-school presentation. Through Lights for Learning, youth raise money for their school or club through the sale of energy-efficient products including ENERGY STAR® qualified compact fluorescent lamps (CFLs), and light-emitting diodes (LEDs). The product list has incorporated personal energy meters, student desk lamps, and “smart” power strips. The specific product mix changes year-to-year based on discussions with program staff and sponsors, and reflects factors such as energy savings, product sales, technological advances, and market saturation. Students retain a portion of the funds raised through the sale of products, which may be applied to any school-sanctioned initiative.

Staff often describe participation in Lights for Learning with the tagline “Fundraising with a conscience.” Lights for Learning sets itself apart from fundraisers in which students sell junk food or unrecyclable gift-wrap by offering products that award buyers with a demonstrable cost and energy savings. There is a growing trend in schools toward adopting more altruistic or healthier fundraising options. For example, a 2010 study in a Midwestern state found that half of all schools had adopted policies prohibiting fundraising through the sale of junk food or prohibiting the sale of foodstuffs entirely (Kubik et al. 2010). By promoting efficient lighting in their neighborhoods and through dinner-table conversation at home, the children become educators to their community on energy efficiency. Perhaps most importantly, the habits that students adopt through the Lights for Learning fundraiser will help in making energy-conscious choices an integral part of the rest of their lives.

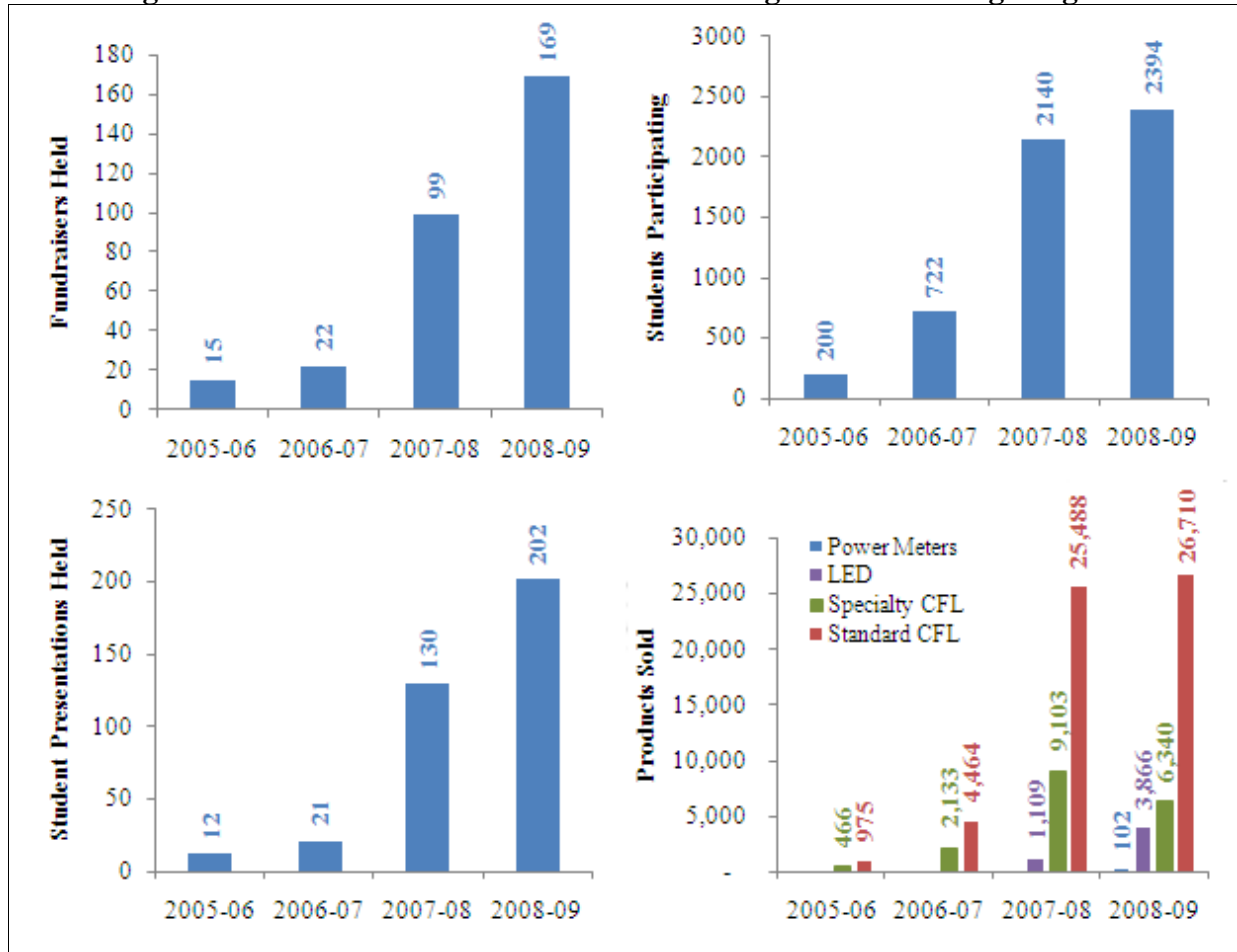
Though the program framework encompasses multiple facets in communicating and delivering on efficiency, MEEA feels that offering flexibility and scalability is a true virtue in K-12 programs such as Lights for Learning. While MEEA’s preference would be to incorporate the full breadth of Lights for Learning into any participant’s involvement, the reality is that there are wide varieties of constraints that shape each school’s involvement. It would be presumptuous to assume that energy efficiency can be more than a tiny portion of the aggregate curriculum schools provide to students. For Lights for Learning to find itself a place in as many K-12 schools as possible, the program must exhibit tremendous flexibility in its execution.

Each component of the program is considered therefore to be modular and may be administered independently of each other. The program can be tailored to the participation of a single classroom, or an entire student body. The fundraising component may take place over several weeks, at a single event, over the entire school year, or not at all. The program has also begun to experiment with permanent sales kiosks installed in seven park districts in Illinois. While these kiosks make up a relatively small portion of program sales, they provide a pathway to the program for entities who are unable to dedicate resources to face-to-face sales. Supplemental educational materials are optional and are only provided to the extent that schools are able to make use of them. Lastly, the eligibility of fundraising groups has been expanded to incorporate additional fundraising groups including Boy Scouts of America, local zoos, and 4-H clubs.

Program Results

Over its brief history, the Lights for Learning program has seen large, consistent growth in virtually every area. Figure 1 depicts the levels of growth seen in several key program metrics, from the program's inception through the most recently completed program year.

Figure 1. Historical Performance Metrics for Lights for Learning Program



Expansion, Sponsorship, and Retention

MEEA attributes the expansion of the program to the confluence of several important factors. First, the support of the program sponsors cannot be overstated. Having begun in year one with the support of only one sponsor, MEEA has worked with that sponsor, DCEO, to procure resources through three distinct grants, which has increased their funding contribution by 650% since the initial program pilot. Likewise, MEEA has worked to draw additional sponsors into the program. Illinois utilities Commonwealth Edison (ComEd) and Ameren Illinois Utilities (AmerenIU) have both participated as program sponsors for several years. The financial support of the utilities supplements the publicly funded component, ensuring that students in private schools are also eligible to participate. By drawing together a coalition of multiple sponsors

covering varying geographies and demographics, MEEA has ensured that every K-12 student across Illinois wishing to participate in a Lights for Learning fundraiser may do so.

Going beyond the firm support of program sponsors, a broader network of program allies has done much in offering in-kind support, exchange of marketing, and consistent messaging. Lights for Learning program staff have worked to build a broad coalition of partners which includes Chicago Public Schools, Brookfield Zoo, the Illinois Governor's Office, the Alliance for Climate Education (ACE), the national ENERGY STAR program, the National Energy Education Development Project, the Archdiocese of Chicago, and multiple park districts in Illinois. By making use of its coalition of partners, Lights for Learning is able to make use of top-down communications and marketing to potential program participants at a minimal additional cost.

Additionally, MEEA has worked with both its sponsors and contractors to ensure that the program remains malleable from year to year. The ability to remain nimble and loose in adjusting the program framework has prevented Lights for Learning from stagnating. No aspect of the program is considered sacred and at the end of each program year a broad assessment of program successes and challenges takes place, in order to adjust the program to incorporate the improvements needed to encourage program growth. For example, the product mix is tweaked from year to year to drop products that are not selling as well in favor of alternate products, or emerging technologies. The long life of CFL and LED products make it essential for the program mix to be dynamic, as MEEA wishes to avoid losing participants with heavy involvement in the program due to socket saturation in their community – a result that is desirable in an energy-saving context, but one that can also hinder the program's growth. Similarly, the curriculum and classroom materials offering expand yearly to offer materials that are more diverse, as well as more specifically targeted to specific age groups. The themes of school assemblies are also tweaked as needed to bring fresh topics to students, and to touch upon timely or relevant issues such as CFL mercury and recycling. By varying the product mix and the program curriculum, the program has been able to maintain an approximate 60% retention rate amongst past participants from year to year. Likewise, the program evaluation itself continues to improve as independent evaluation of the program is now mandated due to the program's incorporation into a statewide Energy Efficiency Portfolio Standard.

Experience Gained

During its tenure as administrator of the Lights for Learning program, MEEA has accumulated critical experience in refining its approach to youth-oriented efficiency programs. The program as it currently stands is a distillation and refinement of five years' experience in targeting students across Illinois. What follows is an examination of several key program themes that have resulted in a robust and growing program.

Community service & moral obligation. Schools and students participating in Lights for Learning fundraisers have the freedom to determine how the funds raised through their program are applied. As discussed earlier, MEEA is motivated to allow as much latitude as possible for fundraising schools so as not to exclude any schools arbitrarily. Nevertheless, it is preferable for participants to incorporate energy efficiency into their involvement wherever possible. For this reason, the most favorable outcome of a Lights for Learning fundraiser from MEEA's perspective occurs when students are educated on efficiency, use this education to achieve sales

by promoting energy efficiency, *and then parlay the funds raised into additional energy-conscious activities*. From both an efficiency and public relations perspective, a positive feedback loop in which efficiency begets efficiency allows the program to tell the best possible story. In the most recent completed program year, approximately 10% of participating schools applied their funds raised toward altruistic and/or ecologically-minded efforts. Some notable examples are shown in Table 1.

Table 1. Sample of Participants' Use of Funds Raised

Participant	Use of Funds
Keith Country Day School	Purchase of a wind turbine for the school
Deerfield Park District	Purchase of environmental teaching aids for park educational program
Peoria County Farm Bureau 4-H Program	Support cooperative 4-H Council green activities
Campus Middle School for Girls	Purchase of mosquito netting for an all-girls school in Sudan
Amos Alonzo Stagg High School	Conversion of school courtyard to an active, sustainable nature center
St. John the Baptist Catholic School	Develop and promote a town-wide recycling initiative
Golf Maine Park District	Fund a scholarship program for environmental awareness summer camp

With the belief that fundraising outcomes such as these should be encouraged, MEEA has sought to assist schools taking this approach more directly. In the current program year, a number of elements have been added to the program to that end. Specifically, the program sign-up sheet now prompts fundraiser coordinators to inform program staff if applying funding toward eco-projects is a possibility. As well, a “Community Projects” one-sheet is now included in all program outreach packets. This sheet spells out a number of project ideas toward which schools may choose to apply funds raised. Several examples of these project types are shown in Table 2.

MEEA has also offered itself up to fundraising coordinators to provide logistical support to students and schools in bringing community projects to life. Community projects can involve coordination between multiple local partners, an intimidating prospect for many students. By acting as a liaison between students and external partners, MEEA hopes to give student groups a foothold in engaging the broader community. Lights for Learning has also forged a coalition with a strong ally in the Alliance for Climate Education (ACE), another organization offering on-site education to students on taking action on energy issues. Through an agreement with ACE, Lights for Learning is pooling financial resources and logistical assistance in bringing about school initiatives to oppose climate change.

In the coming program year, MEEA is considering an expansion of the theme of benevolence for schools looking to seize upon energy efficiency in direct ways. The prospect of Lights for Learning classroom grants is under discussion, which would allow participating schools to apply directly for program funding in small amounts which could be applied to efficiency upgrades or initiatives within the school or community. MEEA is working with program sponsors to allocate a portion of the future program budget for this funding mechanism.

This alternate route to efficiency could be an appealing prospect to schools for whom fundraising is an impossibility, or for those looking to fast-track their involvement in sustainability initiatives.

Table 2. Lights for Learning Community Project Concepts

Project Type	Name	Description	Potential Partners
Community Outreach	Project Change Out	Proceeds used to purchase additional CFLs to be distributed to low-income areas and elderly housing complexes.	Community leaders and city officials, local retailers and businesses
Community Outreach	Ecosystem Restoration	Use funds to restore ecological health of a local forest, pond, wetland, meadow or prairie.	Park districts and forest preserves
Community Outreach	E-Waste Recycling	Begin a school and/or community electronics recycling program for large and small electronics.	Local retailers and business; Staples, Office Max, Best Buy, Sipi Metals
Energy Education	Master Speaker	Bring in a well-known energy or climate change speaker for a school-wide presentation (sports figure, celebrity, etc.).	School PTA/PTO, local community leaders, local professional and semi-pro athletic associations
Energy Education	Students to Teachers	Stage a performance or play for younger students in neighboring schools to educate them about energy efficiency.	Performing arts and theater centers, music schools/studios, lighting and sound production companies

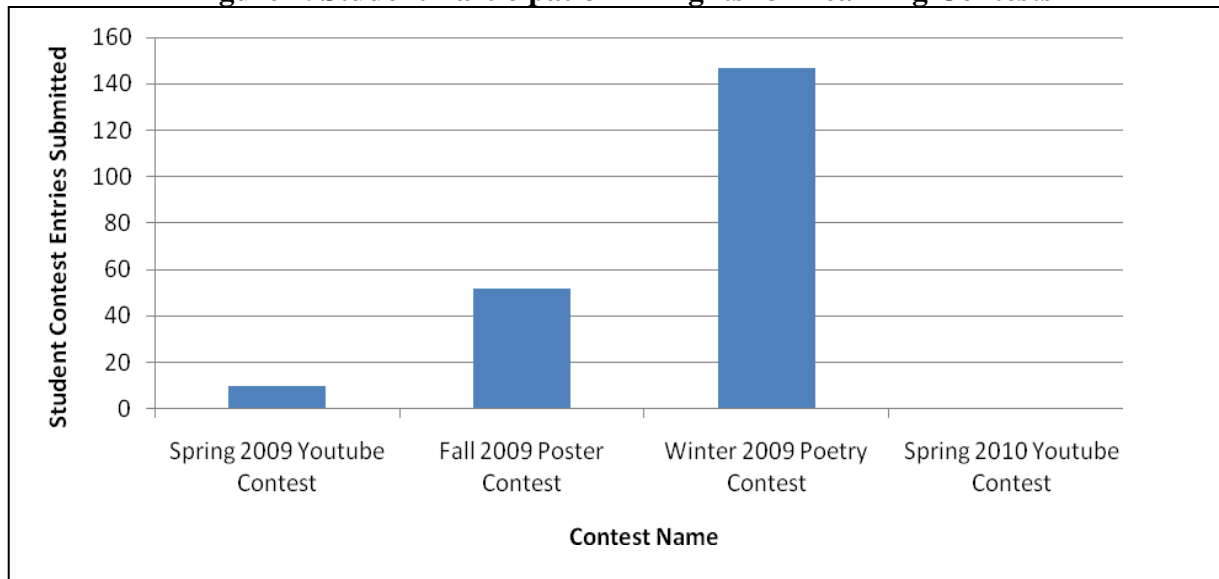
Competition as a driver. The presence of competition in the lives of students is so pervasive as to be self evident. The close daily proximity of large numbers of students, coupled with the academic, athletic, and social jockeying makes it impossible for students not to compare their performance with others. While this quality of student life can introduce pressures into the lives of students, there is also opportunity to seize upon the best qualities of competition to drive students to perform. Recognition of the highly competitive nature of student life has led MEEA to integrate competition into school and student participation in Lights for Learning.

Annual awards ceremonies, which recognize both top-performing schools and students in terms of products, sold have been a part of the program since its inception. These annual events typically draw together entire schools through recognition ceremonies that bestow top program participants with praise and a token of participation such as a plaque or trophy. Local press, school administrators, teachers, students, and community leaders come together at these events, and recognized schools and students typically go on to continue strong involvement in the program in subsequent years. These events also drive additional new participants to the program through the interest they generate.

More recently, MEEA has begun to experiment with using competition to increase program participation through various contests that seek to drum up interest in the program, while encouraging students to think about energy efficiency creatively. In the previous school year, one contest took place, and three will take place in the current school year. All of these contests involved applying creative expression through video, poetry, or artwork. Despite fears that expanding the number of contests might over-saturate student interest, participation in competitive events has grown with each succeeding event. By heavily promoting contest winners through the program, student enthusiasm for Lights for Learning contests have been riding a crest throughout the current school year. Also, the marketing of the various contests has been

adjusted to increase participation. Promotion of the initial Youtube contest in 2009, for example, took place through advertisements in two large newspapers. This approach resulted in a relatively small number of entrants, due mainly to narrower geographical coverage and the prohibitive costs of sustained marketing. With the contests that followed, promotion took a more school-oriented approach. Rather than making costly media buys, the program made use of its established communication conduits such as the monthly newsletter, email distribution lists, and providing participants with promotional materials. This approach resulted in the desired uptick in participation and future contests will feature this more targeted approach, shown in Figure 2.

Figure 2. Student Participation in Lights for Learning Contests



Note: Spring 2010 Youtube contest is currently in progress, with a submission deadline of April 16

Incorporating contests into the program have served the program in several ways. By asking students to think creatively about energy efficiency, they spend additional time considering the issue of energy waste, and employ creativity in encouraging others to do likewise. The students’ efforts in getting the efficiency message across encourage them to act as advocates for efficiency by appealing to their audience in ways that are both clever and effective. Student contests also provide the program itself with useful marketing tools. The winning Youtube contest entries have been used broadly in promoting the program, and the winning entry in the fall 2009 poster contest will be used in marketing materials for the coming school year.

In addition to tapping into students’ competitive natures through contests, MEEA has also sought to encourage the use of friendly inter- and intra-school rivalries as a way of ratcheting up fundraising involvement. Schools which are planning to run multiple Lights for Learning fundraisers (either simultaneously between different groups, or at different times across the school year) are encouraged to challenge themselves to trump a competitor in terms of overall sales, or surpass a previous goal or benchmark they themselves have reached. Capitalizing on rivalries is not without its challenges, however, as coordination between participants can be very difficult. Fundraisers often require approval far in advance, and may require the blessing of the Principal, School Board, Parent-Teacher Organization (PTO), etc. In addition, there is fierce competition in schools by providers of fundraising opportunities, and the timing of fundraisers may have strict constraints due to a variety of external factors. To alleviate

some of these challenges, Lights for Learning program staff offer themselves up as liaisons between schools to assist in coordinating competing fundraisers. Additionally, staff have drafted a “Challenge Letter” template which schools themselves may tailor to their needs and send to a rival school as a way of initiating a fundraising challenge. An area yet to be explored through Lights for Learning is collaborative, rather than competitive, fundraisers amongst multiple participants.

Social networking. An area in which there is large unrealized potential for program growth is through Internet-based social networking. With the prevalence new media such as Facebook, text messaging, and Twitter, we have witnessed a transition in peer-to-peer communication, and as expected, youth are leaders in early adoption. MEEA is still working to adapt itself to fit these new modes of interaction and socialization. A Lights for Learning Facebook group was established over a year ago and has barely reached into the double digits in membership. Program staff has spoken with program participants on their use of social networking sites, and there are ostensibly a number of barriers to broader integration of social networking into the program. Schools are reluctant to encourage use of these sites due to the liabilities in encouraging online social connections without possessing any way to monitor what sort of information is being exchanged. On the other side of the coin, students report using Facebook in large numbers, but the pervading attitude amongst students in the K-12 age range is that social networking is for friends, fun, and frivolity. Participation in “socially responsible” networking groups, even when backed by large pools of members, is typically slight in terms of discussion and long-term engagement.

These characteristics have caused MEEA to re-focus its communication with students on reaching them through teachers and administrators. A more effective conduit for communication has been found by developing a monthly program newsletter delivered to all program participants. This direct means of communication allows for targeted, controlled, and relevant program information to be conveyed to participants. Updates to the lights4learning.org website have become increasingly frequent and its prominence as an outreach tool to all program partners has grown. Use of the micro-blogging site Twitter has been considered for direct communication, though recent trends suggesting that growth on the site may be reaching a plateau (Rao 2009) has MEEA taking a “wait-and-see” approach for the moment. While MEEA seeks to make the most of new communications avenues, program resources are limited and cannot be applied indiscriminately. A somber assessment of new communication approaches must be employed to separate “fads” and “buzz” from what is truly effective.

Interestingly, the most active participants in social networking appear to be the teachers themselves. The educational ecosystem is tightly knit and communication within particular schools and between educators is crucial in driving participation. For this reason, the program seizes any opportunity to penetrate the educator network through school board associations, teacher associations, and targeted events relating to science or energy. A strong program presence within Illinois at meetings of these groups is vital, as it drives more than a third of participating educators to the program. Light’s for Learning’s education coordinator also consistently reports “word of mouth” as one of the program’s key participant drivers. Making good use of existing professional networks is not only effective, but allows MEEA to stretch the program’s marketing dollar.

Evaluation and Evolution

Through program sponsor DCEO, the 2008-2009 instance of the Lights for Learning program was independently evaluated by Summit Blue Consulting and Opinion Dynamics Corporation (Grabner & Bloom 2009), and the results were shared with MEEA. MEEA has taken this opportunity to absorb the feedback and suggestions received by a third party in order to improve upon the program framework. Internally, a brief participant survey is sent to all fundraiser coordinators participating in the program each year. For the most recently completed program year, survey respondents provided the following feedback:

- 90% felt the program provided an appropriate number and type of efficiency products to sell.
- 97% felt the price point of fundraiser products were ideal.
- 79% felt the product order form was easy to use and understand.
- 67% stated that in-school presentations by program staff added substantial value to the program.
- 92% agreed the program provided enough information on the energy, economic, and environmental benefits of energy-efficient products needed for the participants to effectively sell the product
- 68% of participants raised as much or more funds than expected.

Based on both internal and external assessments, MEEA has identified a number of modifications, shown in Table 3, to incorporate into the program over the coming year that it expects will streamline and expand the program.

Table 3. Current & Near-term Modifications to Program Framework

Issue	Proposed Solution	Adoption Timeframe
Schools' difficulty in obtaining resources in challenging economic environment	Increase fundraising portion retained by schools from 50% to 60% of energy-efficient products sold	Completed
Public fear of 'mercury issue' in CFL products	Transition to low-mercury CFLs in product mix; education on mercury and CFL recycling in schools	Completed
Difficulty of participants in understanding quantifiable benefits of products sold	Create tool for schools to translate kWhs saved into relatable metrics such as trees planted, cars taken off the road, homes powered for one year, etc.	2010-2011 program year
Need for consistent messaging and understanding of energy efficiency	Coordinate with the staff of the national ENERGY STAR program on the development of all program materials	Initiated summer, 2009; Ongoing
Decelerated transformation of lighting market toward energy-efficient products (DOE 2009)	Incandescent "early retirement" campaign with possible incandescent trade-in incentives	2010-2011 program year
Need for program's claimed energy savings to reflect a dynamic, changing environment	Development of a program Technical Reference Manual which codifies program assumptions and savings formulas, updated annually	Complete by end of current program year
Need for consumers to better understand their home energy profile	Delivery of home energy meters to public libraries across the state, with accompanying activity book for assessing energy use in the home	Complete by end of current program year

Lights for Learning is a growing program that takes advantage of social trends to drive students, their parents, and the broader community toward energy-efficient behaviors and provide them with high-quality energy-efficient products to meet their schools' fundraising needs. Strong participation and growth in competitions and the use of social media are helping expand the program and the use of both third-party evaluation and participant assessments will create continuous improvement in the program and its results.

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