



BACKGROUND

One of d.light's core social impact objectives is to create a better at-home study environment for students who previously relied on kerosene for lighting. The poor quality and noxious fumes of kerosene lanterns hinder the ability of children to study productively, whereas solar lighting can facilitate longer or more effective study time, in turn leading to increased academic achievement.

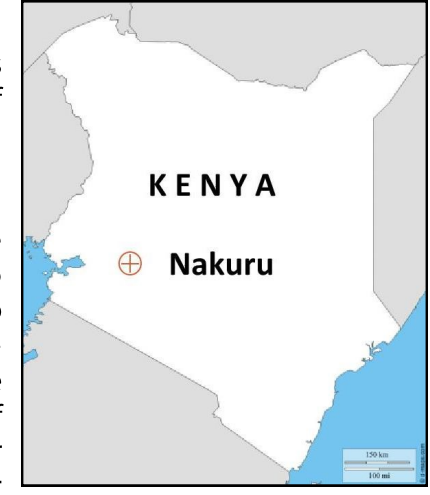
In early 2014, d.light's Kenya team began piloting an awareness campaign in schools to reach school-aged children by educating them about solar energy and allowing them to experience solar energy at home. Based on a previous schools campaign pilot carried out in India three years prior, d.light hypothesized that students could act as agents of change within their households, catalyzing large-scale solar adoption and improving their study environments.

Rigorous impact measurement is a cornerstone of d.light's commitment as a social enterprise, in order to generate a strong evidence-base about the effects our products have on consumers' lives. d.light therefore commissioned a third-party evaluation of this awareness campaign to examine the impact of solar lighting on educational attainment and attitudes.

EVALUATING THE SCHOOL CHANNEL'S IMPACT

d.light partnered with a Kenya-based research firm, to design and execute a cost-effective study on the social impact generated through the school campaign. The evaluation sought to measure the effects of the program on the following variables: 1) change in household spending on lighting; 2) change in student study hours; 3) change in student motivation; 4) change in student performance; and 5) change in school attendance. To correlate these changes to solar lantern adoption, the study looked at both households that purchased a lantern following the program and households that did not, comparing data from baseline and endline surveys with these two groups to assess the level of change after solar lanterns were introduced.

For the baseline survey in early 2014, d.light's research partner interviewed 275 families of students who had experienced an in-home trial of a lantern: 142 of these households had decided to purchase a lantern after the trial had ended (the "treatment group"), while the remaining 133 households had students who had trialed a lantern but had elected not to purchase one (the "comparison group"). Non-purchaser students included in the study were matched to purchaser students on the basis of gender, home village, and lack of electricity or solar in their homes. For the endline survey four months later, the survey team was able to reach 243 of these same families: 132 families from the treatment group who had purchased and 111 families from the comparison group who had not.



Respondents—primarily the students' mothers—were interviewed at both the baseline and endline stages regarding the use of and expenditure on various household lighting sources, their students' education-related attitudes and practices, factors that motivated them to purchase a lantern following the campaign, and overall satisfaction with the product. To assess students' academic performance, d.light's research partner collected additional information directly from the schools that participated on student's position in class and other academic measures. d.light's partner also held focus group discussions with teachers.

RESULTS

Variable	Result
Change in perceived value for money of d.light products	Nearly all purchaser households at endline reported finding d.light lanterns to be good value for money, with this percentage increasing from 87% to 98% from baseline to endline. This highlights the fact that regardless of the light's social and economic benefits, customers are highly satisfied with the product itself.
Change in household spending on lighting	Household spending on lighting decreased by 74% for purchaser households on a weekly basis whereas non-purchaser households experienced only a slight drop of 4.5% d.light solar lanterns entirely displaced kerosene in purchaser households with 93% reliant on their d.light lantern at endline. The dominant frequency of kerosene purchase dropped from once a day to once a week for purchasers. The majority of non-purchaser households continued to purchase kerosene on a daily basis.
Change in student study hours	Weekly out-of-school study hours for purchaser students decreased, suggesting students were able to study more efficiently given that academic performance improved for purchaser students. This is likely due to the brighter, more consistent, less irritating light of a d.light lantern vs. kerosene
Change in student performance	More d.light lantern purchaser students improved their class position between baseline and endline than did non-purchasers, with 53% of purchasers reporting improved class position at endline vs. only 42% of non-purchasers

These findings clearly demonstrate that **d.light lanterns were effective in improving household finances and students' academic performance.**

Other key findings included the fact that **children in the household use the solar lantern primarily for education.** Though at baseline this was the primary use for the lantern within the house, **over time, adults reported widespread household use** for a range of tasks. This validates the hypothesis that underpins d.light's school's awareness campaign; namely that **introducing a new technology through students was effective at generating intra-household behaviour change.**

While d.light had initially intended to track change in student rates of attendance and students' level of motivation, changes in these categories were inconclusive, primarily due to very high reported rates at baseline that left little room for change.

KEY OUTCOMES

Given the correlation between d.light lantern purchase and improved school performance for students without access to electricity, it is clear that having a reliable, high-quality lighting source can contribute to academic outcomes. While the sample size was relatively small, this study nonetheless constitutes the most rigorous examination to date of the energy access – education nexus. d.light intends to expand on the initial learning from this study through a larger-scale, longer-term study that will allow for more robust validation of these results.

Moreover, reported lantern usage data validates d.light's hypothesis that students are an effective entry point in catalysing solar adoption at the household level. While initially respondents identified the student participating in as the lantern's primary user, use of the lantern was distributed evenly across all family members by the end of the evaluation. Use of the lanterns by the households' adults increased from 50% to 83% for general household tasks and from 6% to 81% for personal use.



The study also demonstrated that families' perception of the lanterns' value and utility increased the longer they were in possession of a lantern. For purchaser households, perceptions of the d.light lantern's value for money, usefulness as a study aid, and use in completing other household chores increased dramatically from baseline to endline. This suggests that once households are able to experience improved lighting in their homes, they never want to return to kerosene.

About d.light

d.light is a global solar energy company delivering affordable solar-powered solutions designed for the two billion people in the developing world without access to reliable energy. d.light provides distributed solar energy solutions for households and small businesses that are transforming the way people all over the world use and pay for energy. Through 10 field offices and four hubs in Africa, China, South Asia and the United States, d.light has sold over eight million solar light and power products in 62 countries, improving the lives of more than 40 million people. d.light is dedicated to providing the most reliable, affordable and accessible solar lighting and power systems for the developing world and reaching 100 million people by 2020.



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