

MEDB Sponsors Education Summit Focusing on STEM Education and Graduation Rates

I. Education in Maui Nui

Education in Maui Nui and the State of Hawaii is at a crossroads. Three important challenges face our community as we go forward in providing a secure and prosperous future for our children.

Challenge to improve student learning

The Hawaii State Department of Education continues to exercise leadership and work diligently on improving Hawaii's schools while dedicated teachers are making strides in increasing student learning and retention; however, there are still many challenges that need to be met at all levels.

According to the State Department of Education, 2 out of 10 students in Hawaii do not graduate (cf. *State of Hawaii NCLB School Report SY 2009-10.*) This translates into almost \$900,000,000 in lost productivity.¹ The state averages for proficiency in Reading and Math are 67 percent and 49 percent respectively. These scores reflect significant improvement over the last 7 years since the implementation of the federal mandate entitled No Child Left Behind (NCLB) but are still below the proficiency levels necessary to meet the numeracy and literacy requirements of an increasingly Science, Technology, Engineering and Mathematics (STEM) based workforce.

There are eight high schools in Maui Nui. Six of the eight have met the NCLB proficiency targets in Reading and four of the eight have met the proficiency targets in Math. The current NCLB status of the eight high schools finds one school in good standing, unconditionally, while the other seven are classified as restructuring.

All high schools except one in the County have met the current NCLB graduation rate targets (80 percent); nonetheless, there is a concern about the meaning of graduation as evidenced by the Board of Education's (BOE) program called the "STEP UP" diploma. "This diploma, available for the graduating classes of 2013 and beyond, is different from the regular high school diploma. It includes more challenging classes in math, science and writing, and it also includes the completion of a senior project." (cf. <http://www.stepuphawaii.org/>) This initiative was the result of a statewide collaborative effort called the P-20 Partnerships for Education. There are discussions in the BOE to require the more rigorous diploma for all students beginning with those students graduating in 2018.

¹ This calculation is partly based on figures provided in the Issue Brief, Alliance for Excellent Education (AEE), August 2009. AEE uses a graduation rate of 63.9 percent (school year 2005-2006) to project a non-graduating population of 6202 in 2009 and then multiplies that by \$260,000 - the estimated lifetime earnings difference between a high school dropout and a high school graduate. The DOE claims an 80 percent graduation rate for 2009 thus the non-graduating population would be 3343. Multiplying the estimated lifetime earnings difference of \$260,000 by the projected non-graduating population based on the DOE graduation rate of 80 percent makes the lost productivity cost \$869,283,018 as versus \$1,612,520,000 projected by the AEE. See Moreno, Loren, *State Disputes Dropout Count*, Honolulu Advertiser, September 8, 2009.

Challenge to increase teacher retention and proficiency

The DOE hires more 1300 teachers every year but more than half of Hawaii's public school teachers leave within five years of being hired. In 2009 only 44 percent of teachers hired within the previous five years were still in the classroom. The DOE has pointed to the high cost of living, the number of teachers hired from the mainland (23 percent in 2009), and the lack of support networks as variables that affect retention (cf. Honolulu Star Advertiser, 9/7/2010.)

Federal guidelines under NCLB require all teachers to attain certification as "highly qualified" teachers. 70 percent of math, 77 percent of language arts teachers and 81 percent of science teachers are rated as highly qualified in Hawaii. The DOE has set the ambitious target of 100 percent highly qualified teachers in these hard-to-staff subjects by 2014 as a part of its Race to the Top reforms (cf. Race to the Top application, <http://doe.k12.hi.us/arra/index.htm>.)

Challenge to provide adequate fiscal resources and infrastructure

The student population of the eight high schools in Maui Nui numbers over six thousand students. Based on figures for per pupil expenditures in the 2009 Maui Data Book, the outlay for these institutions in 2007-2008 was approximately 83 million dollars.

During the economic downturn that began in 2008, the Governor, the Legislature, and the Board of Education struggled to shrink the state's education budget in the face of declining tax revenues. The debate and disagreements on how reduce the education budget by 473.7 million dollars over two years ultimately led to a controversial solution - Furlough Fridays. Furlough Fridays removed 17 days from the school year, making Hawaii's school calendar the shortest in the nation - 163 days. This stop gap measure to balancing the state budget was finally discontinued at the end of the 2009-2010 school year.

II. Response to These Challenges

With every challenge comes an opportunity. On August 18, 2010, Maui Economic Development Board, Inc. with the support of America's Promise Alliance and guided by the Millennium Institute, a non-profit organization dedicated to sustainable planning, convened a summit on education. The theme of the gathering was *E Ulu - Growing Together*. The symbol of the *ulu* or breadfruit communicates the significance of growth and accomplishment which is best achieved through community effort.

This conversation focused on STEM education as a vehicle to high school success. The event gathered stakeholders in industry and business, government, the non-profit sector, education, parents and students to discuss and model those factors which make up the education sector in Maui Nui and, in turn, affect graduation rates. The summit was the first step in the process of creating a data driven long range planning model that would inform policy makers and planners to strengthen the Science, Technology, Engineering, and Mathematics (STEM) education pipeline while also increasing the chances for high school success.

III. E Ulu - Growing Together

MEDB focused its summit activities and discussions on strengthening the STEM pipeline as a means of improving high school success. MEDB leveraged its prior relationship with Millennium Institute to guide the group in mapping out the challenges and sketching out a plan for future action. The outcome of the summit itself, based on the input from summit participants, was a *causal loop diagram* modeling the education system locally (with many applications state-wide) in terms of the four proficiencies necessary for the success and operation of the system: 1) Student Proficiency, 2) Teacher Proficiency, 3) School Proficiency, and 4) School Management.

The following are some of the themes and highlights of the summit activities: **1) Inspiration** - The keynote was provided by the Honorable Mazie Hirono, 2nd Congressional District, State of Hawaii. **2) Outlining Challenges, Identifying Opportunities, Sharing a Vision** - This portion of the summit began with presentations by a parent, an industry/business professional from a local tech company, and a high school principal. These presentations were followed by a panel of 5 high school students. All the participants were asked to outline the challenges, identify opportunities and share their vision of education. In the case of the students, they were asked to describe the challenges they faced in high school and to identify potential opportunities inside or outside the present educational structure that would keep them engaged. These interventions were pivotal in setting the direction and tone for the rest of the day. **3) Mapping the Challenge** - Dr. Andrea Bassi led this portion of the plenary session. We first engaged the entire assembly by asking them to identify what variables they believed contributed to the four proficiencies (Student, Teacher, School, and School Management) and what they considered the causal relationships between these variables. This session was followed by Breakout Sessions that focused on each of the four proficiencies in depth. After the breakout sessions, the groups shared the results of their work to the entire group. This work after the summit was incorporated in the final causal loop diagram. **4) What's next?** - In this portion of the summit we discussed future actions and outlined the next steps, including the creation of an Education Working Group.

IV. Description of Causal Relations Identified

Education is relevant for workforce development to bring about a more diversified and green economy for Maui Nui. Our analysis focused on evaluating the role of education in the county within its broader social, economic and environmental contexts. Building on a pioneering study carried out by the Center for Resilience at Ohio State University and Millennium Institute, we identified key cross-sector factors being influenced by education in Maui that drive our longer-term social and economic development. First, better education increases local skills, augmenting the intellectual capital in Maui, and possibly increasing research and overall productivity in our economy. When coupled with coherent and effective economic development policies, better education would increase investments and production, thus leading to higher government revenues and household income. These, together with higher employment, would reduce the loss of young local talent thus enhancing the longer-term development of Maui's economy and reduce the so-called "brain drain." Considering the potential growth of a sustainable and green high tech sector, the development of a literate workforce on Maui could lead to both the creation of additional jobs and better environmental preservation and quality, thus contributing to higher quality of life - a key driver of tourism and most sectors of Maui's economy. In turn, a better economy creating more opportunities for young entrepreneurs and attracting more capital, would trigger a positive feedback loop with the education sector, where new talents will be trained and introduced into the local, but more diversified and globally competitive, market.

During the summit we analyzed education in the context of society, economy and environment particularly investigating the role of students, teachers and schools in Maui County. Our main findings indicate that numerous stakeholders in the local community play a vital role in supporting the three main actors identified, including business (for potential job creation and mentoring of administrators), non-profits (for, among others, potential funding allocated to science and technology projects), and higher education (for research as well as mentoring of students and teachers.) The impact of student social networks, the community's perception of the value and relevance of education, the development of standards for school excellence and how these are shared within the community, and the necessity for local school advisory councils are also relevant factors.

More specifically on the three main actors analyzed:

- Students: the proficiency of students is influenced directly by self support, motivation and attendance. Indirectly, these are further affected by family support, the marketing (or characterization) of STEM and education, career planning support, social cohesion, teaching methodology and curriculum, as well as school structure (including class composition, class and school size, school calendar and extracurricular activities supported.)

- Teachers: the proficiency of teachers is primarily influenced by the number of teachers, their quality (skills) and methodology. These key factors are further influenced by salaries, professional interactions, assessments of skills and accountability, professional development, administrative support and school structure.
- Schools: the role of school is primarily determined by the curriculum, school structure, infrastructure (physical and virtual) and administrative support. The factors affecting the primary drivers of school effectiveness are class composition, class and school size, school calendar and extracurricular activities supported, principal's salary and professional development.

The main cross cutting impacts and leverage points across actors include community involvement and support, as well as teaching methodology and curriculum, and school structure. The financial sustainability of schools and the school system is essential with funding key to defining: 1) the number of teachers, 2) their professional development opportunities, and 3) their assessment and accountability. Funding also determines the number and types of extracurricular activities supported, infrastructure improvement and administrative support.

V. Lessons Learned And Next Steps

MEDB's experience at the summit taught us three important lessons:

- Bringing all sectors of the community together creates synergies for action to meet the challenges we face in education and building up the STEM pathway.
- Both strategic and long term planning is necessary to support our students, teachers and administrators in building schools that excel.
- Business and Industry are important partners in growing the tech sector and supporting STEM education as a means to strengthening high school success and enhancing workforce/career development.
- There is a clear need to develop analytic and decision making tools that will assist policy makers and legislators plan for the future of education in Maui County and the State of Hawaii.

Subsequent to the summit, MEDB plans to convene an Education Working Group from the summit participants that will continue the work of *E Ulu* in analyzing the challenges of education and assist in developing the analytical tools necessary for long range planning and decision making.