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Building New Lives; Constructing a New Organization

BBEI

Berkeley Biotechnology Education, Inc.

The Story and the History

Building Young Lives, Building a New Organization:
A History of Berkeley Biotechnology Education, Inc. (BBEI)

by
Fern Tiger Associates

The founding and subsequent development of Berkeley Biotechnology Education, Inc. (BBEI) are at once entirely unique – steeped in the history, culture, and needs of a particular community and group of young people – and yet emblematic of most new nonprofit organizations. The carefully planned structure, launch, and expansion of BBEI make its story one which may be useful to other youth service agencies as they form and navigate strategies for start-up, stabilization, and growth.

BBEI's story was compiled and documented by Fern Tiger Associates, an Oakland-based public education and community relations consulting firm. Fern Tiger Associates played a key part in the creation of BBEI and its subsequent development. In 2000, with grant funding from the James Irvine Foundation, BBEI approached Fern Tiger Associates to "tell the BBEI story." Given its central role in helping to create BBEI, it was felt that Fern Tiger Associates was aptly positioned to provide a thorough examination of BBEI's history based on a deep engagement in the formation and growth of the agency.

In 2000, BBEI received a grant from the James Irvine Foundation to conduct a comprehensive review and evaluation of its program. The intent of the grant was not only to allow BBEI to study the impact of its work with students, but also to assess the cost effectiveness of the program and to examine its historical evolution. Funding was provided for: 1) a quantitative program evaluation; 2) a program cost analysis; and 3) an agency "narrative."

Quantitative Program Evaluation: MPR Associates was contracted to conduct a comprehensive, two-year, longitudinal evaluation of outcomes for BBEI students. The evaluation had at its core a rigorous, statistical framework that used national secondary and post-secondary databases from the National Educational Longitudinal Study (NELS). NELS data were used to create national control groups against which BBEI students could be compared to assess with a reasonable degree of statistical confidence whether BBEI program participants do better than comparable student cohorts on a range of outcome measures, including successful completion of science classes, academic performance as measured by grade point average, graduation from high school, and enrollment in, and completion of post-secondary education. In addition to this quantitative analysis, MPR conducted focus groups with students, a discussion session with parents of program participants, and a survey of employers of BBEI students and program graduates. Results from the evaluation are included in this document.

Program Cost Analysis: The cost analysis reflects the costs of the program based on student enrollment in 2001 as well as at an "optimal" full-enrollment. A number of assumptions were made to support the analysis, though the cost of the original investment on a per student basis was calculated separately. The final result is an annual estimated cost per student of approximately $2,925 and a total cost over the three years of the program of $8,480. (Under a full enrollment scenario, these figures fall to $2,850 and $8,410 respectively.) The original investment calculated on a per student basis including student enrollment through 2001 is approximately $1,325.

Agency Narrative: The agency narrative is encompassed within these pages and can be read as a "stand-alone" piece, but is also intended to inform and complement the quantitative program evaluation and cost analysis.

Background History

In 1990, the Bayer Corporation (formerly known as Miles/Cutter), acting on a strategy to increase its position in the burgeoning biotechnology field, determined that it needed to make a substantial investment (publicly acknowledged to be between $300MM and $1 billion) in its 28-acre Berkeley, California site in order to support the development and manufacture of biologically-based pharmaceutical products. The biotechnology "revolution" had begun about 15 years earlier in South San Francisco when a scientist, Herbert Boyer, and a venture capitalist, Robert Swanson, realized that the development of recombinant DNA technology could have many useful, and potentially profitable, medical applications. Their partnership led to the founding of the first biotechnology company, Genentech. Soon thereafter, other scientists and investors raced to start up biotech companies with commercially viable products. Bayer, a century-old, multinational pharmaceutical corporation, also saw opportunities to move into the biotechnology field.

Though based in Leverkeusen, Germany, Bayer Corp. has numerous administrative and production facilities in the United States. Its facility in Berkeley, California had been in operation for more than 90 years, originally producing plasma-based products through a unit then-known as Cutter Labs. [Bayer purchased Cutter in the 1970s and merged Cutter into its other North American companies under the name of Miles Inc. In the mid-1990s, all Bayer's international subsidiaries were renamed "Bayer."] Senior Bayer management in Germany decided that the Berkeley location – with its close proximity to major research universities and other biotech companies, access to highly-trained scientific researchers, and a large, contiguous location – offered an ideal site to become Bayer's "worldwide headquarters for biotechnology." As Bayer envisioned it, the site's growth trajectory could span 30 years, though senior executives did not have a clearly defined sense of how the site would be used, given the nascent technologies in the biotech field. In order to provide for maximum flexibility in developing the site, Bayer executives sought a multi-year "development agreement"[1] with the city of Berkeley. The development agreement would provide Bayer with special zoning privileges, expedited permit processing, and long-term development rights. Such a legal document had typically been used in the development of shopping malls and office parks and had not previously been used by an industrial

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[1] In California, the legislature enacted the Development Agreement Statute which authorizes any city to enter into long-term, binding agreements with individuals or entities having legal interests in real property, for which the agreements provide for the development of the property. The Statute was intended to strengthen the public planning process, to encourage private participation in comprehensive planning, and to reduce the economic risk of development (from the Bayer Development Agreement with the city of Berkeley).

landowner. Furthermore, this approach had *never before* been attempted in the city of Berkeley and, in fact, the city did not even have legislation on its books providing for this kind of zoning entitlement.

With a little over 100,000 residents, Berkeley's relatively small size belies its tumultuous social history, its eclectic culture, and its high level of recognition nationally and internationally. Founded in 1878, Berkeley is home to the University of California (chartered in 1868 in Oakland and moved to its current site in 1873) which today includes more than 32,000 students. Over the years, the University and the community have hosted many progressive social causes including the free speech, civil rights, anti-war, and anti-apartheid movements. Known for its high degree of civic participation and its tolerance of alternative lifestyles, the Berkeley community has often been suspicious of "establishment" institutions, including the university that bears its name. As a community, it is especially skeptical of large businesses and multi-national industries such as Bayer. In the words of one senior Bayer executive, "Most communities would welcome a growing company that offers well-paying, good quality jobs in an expanding industry." But not Berkeley.

In fact, the Berkeley community was inclined to be particularly leery of a company such as Bayer. Though the biotech industry was a growing phenomenon in 1990, it was still little understood outside of the specialized scientific and venture capital community. Berkeley residents were concerned about animal testing, dangerous bacteria, human mutations, and the possible production of other "toxic" biochemical by-products. Bayer's private, "closed-campus" in West Berkeley only added to local residents' fears about what might be going on behind the company's locked gates. Some in the community also raised the issue of the German company's role in the Holocaust. Others were concerned about the possible effects of Bayer's expansion on local housing costs, traffic patterns, and sewage and waste water management.

In order to move forward in development agreement negotiations with the city of Berkeley, Bayer executives realized that they would need to provide the Berkeley community with a highly visible and substantial gesture of corporate goodwill. With the guidance of its public affairs consultant, Fern Tiger Associates, Bayer sought early input from dozens of nonprofit, community-based organizations and neighborhood leaders. During the ensuing and very public process, hundreds of community residents weighed in at public hearings, commission meetings, and other venues. To understand the range of issues in the community, and to ensure that the concerns of very diverse constituencies were heard and their

desires for the community well-represented, Bayer was introduced to and met with groups representing education, labor, child care, youth development, housing, homelessness, and workforce and economic development.

Over the course of these presentations by various East Bay community groups, Bayer representatives became particularly focused on the areas of education and training. As a German-owned company with a cultural tradition of apprenticeships and vocational training, Bayer had a deep understanding of and appreciation for work-based training for students, which would eventually lead to a skilled trade. Bayer also differed from other start-up American biotech firms because its employment structure included an active labor union which played a role in determining workforce requirements and employee training. Additionally, unlike other start-up biotech firms, Bayer was already in full production mode with some of its products and needed highly skilled technical workers to manufacture its products. Yet, the company had found it surprisingly difficult to hire appropriate workers for these positions. Though Bayer often hired college graduates to fill technical production positions, these employees were generally not interested in remaining at those jobs for the long term and did not want to pursue careers in production, preferring to take on new responsibilities in research and management. Most non-college graduates who might be considered for such jobs did not have the requisite skills and would have taken too much valuable company time to train. According to Karl Duchardt, then senior vice president for production and engineering at Bayer's pharmaceutical division in Berkeley, "We have no problem finding scientists for our research, but it's much more difficult to find people with the skills to operate our equipment." The concept of an education and job training program for non-college bound youth resonated deeply with Bayer's executives, and they knew they could make a strong "pitch" for such a program to their senior management team in Germany. At about the same time, Bayer received correspondence from Berkeley's educator community suggesting that an education-to-employment program could be very beneficial to under-served youth attending Berkeley's only high school.[2]

In late Spring 1991, a series of three "brainstorming" sessions, sponsored by Bayer, explored the possibility of creating a training program which would incorporate academic coursework with hands-on industry laboratory work experience. Bayer had no intention of replicating a program if it already existed,

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2 While the terms "education-to-employment" or "school-to-career" became commonplace in the mid 1990s, it should be noted that in 1991, the concept of an education-to-employment program was quite new and there were few, if any, models to guide Bayer in the development of such a program.

and hoped to tap the knowledge and resources of local education and job training and workforce development experts. Approximately 50 people came to the first session from Alameda County organizations such as Berkeley Unified School District, Building Opportunities for Self-Sufficiency (BOSS), the Peralta Community College District, Center for Independent Living, South Berkeley Neighborhood Development Corporation, Women's Employment Resource Center, and the Berkeley Adult School. Discussions examined what other youth training programs existed in the Bay Area, and what types of components and skills such a program should include. Bayer's "project team"[3] looked at a Boston-based program called ProTech as a possible model. ProTech worked with under-served students at three public high schools to provide an apprenticeship program in healthcare, linking high school and post-secondary education and on-the-job training efforts. It also researched then nascent efforts at creating "academies" within high schools, including the successful but young academies at Oakland schools (Media Academy at Fremont High and Health Academy at Oakland Tech.)

After the first meeting, it was evident that there was no other organization in the Bay Area which offered the same kind of services to youth which Bayer was considering. In the second session, held one month later, a smaller group of about 25 people continued the discussions from the first session. At this stage, it started to become clear that the new program would address Berkeley High's difficulty helping non-four-year-college-bound students to be successful[4]. Thus, it was immediately clear that the program would include academic coursework at the high school and community college level, combined with summer and co-op work experiences in the biotechnology industry. Student participants would also receive support in the form of tutoring, job coaching, mentoring, and other assistance to ensure successful completion of the program and transition into industry positions as entry-level skilled technical workers[5].

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3 To prepare for and proceed with the Development Agreement negotiations, Bayer formed a committee composed of Senior Management, headed by Site Manager and Senior Vice President, Dr. Karl Duchardt. This committee was guided by Bayer's consultant, Fern Tiger Associates. Once plans were underway to assess the feasibility of proposing an education and training program affiliated with schools, a smaller group from this committee was formed. The term "project team" as used here is intended to reflect the work of this smaller group.

4 Berkeley High School, a large, comprehensive, urban secondary school has a long tradition and successful record of preparing high achieving academic students for placement within the UC system and at some of the most prestigious colleges in the nation. By 1992, the high school had eliminated all vocational and training programs; faculty and administration admitted to minimal success with students who were not focused on the four-year college path.

5 In 1992, biotech companies were still defining the job skills needed for production positions. Bayer, and later BBEI, categorized the positions for which the program would prepare students as "entry level skilled technical workers." This term differentiated positions such as equipment washer from the jobs for which BBEI graduates would qualify.

At a third and final session, a small working group reviewed and discussed the preliminary program framework, outlining the basic structure and components of the program. These sessions played an important role, not only in providing early input into the development of an education-to-employment program, but also in building a level of goodwill toward Bayer among the East Bay's cadre of educators and workforce developers, as well as among community leaders who recognized the company's sincerity and commitment to the potential for such a program.

After months of research, participation in more than 100 community meetings, and weeks of negotiations with the city of Berkeley and its residents – and as a part of its Development Agreement with the city – Bayer offered to fund the creation of a new, not-for-profit organization dedicated to providing comprehensive biotechnology training and career opportunities to non-college-bound youth who represented the demographics of south and west Berkeley where Bayer was located. Households in this part of Berkeley were substantially composed of minority and low-income residents. The new organization created to serve these youth would come to be called Berkeley Biotechnology Education, Inc. (BBEI). Bayer's decision to fund the yet-to-be-created BBEI was not just a gesture of corporate goodwill, but was also a carefully considered business decision. The new agency would provide education and job training to young people who would fill important technical positions in Bayer's production unit, allowing Bayer to get more of its drug products to market in a timely manner.

Early discussions at Bayer led to the astute decision that the new entity should be established as an independent organization. Bayer executives felt that the mission of this new program was not a core focus of the company's own business goals and that it did not have experience working with public schools. Others agreed that a legally independent organization, staffed by professionals in the fields of education and job training, would best serve the needs of students. The partners in this project – the city of Berkeley, Bayer, and ultimately the public schools – had very different traditions, aims, cultures, and stakeholders. As a private company, Bayer was driven by its shareholders and by the competition of other biotechnology companies coming to market with rival products. For public schools such as Berkeley High School, the organizational mission was focused on the education of all young people. In contrast to a private company, the process of education can be much slower and more idiosyncratic; teachers and administrators are not driven by a bottom-line mentality, but rather by the developmental needs of students and state requirements. And the city of Berkeley aimed to fulfill the needs of its citizens by advocating for a range of public goods and services, such as education, healthcare, childcare, and

workforce development and to ensure the well-being of its residents through legislation related to environmental controls, land use, waste management, traffic flow, and safety. It was determined that a nonprofit organization would be able to act as an "intermediary" liaison between education and industry – two very different groups.[6] The nonprofit could offer a unique perspective on each, and could translate objectives and outcomes between the partners to ensure that the targeted young people gained the maximum benefit. According to a senior administrator with the California Department of Education, "Intermediaries can do things that schools can't do...They typically can connect business and education more quickly and more effectively....They get people to think outside the box."

Additionally, it was determined that the new agency could gain a number of other benefits through a 501c3 nonprofit status. Such an independent entity could:

- Establish a unique identity and purpose;
- Create and maintain a broad, community-based board of directors which would independently govern agency operations;
- Ensure collaboration from diverse community stakeholders;
- Assure program continuity with the values of the local community;
- Understand and support students beyond purely academic needs;
- Establish fiscal independence and maintain community oversight, ensuring that the agency would not be a "tool" of the biotech industry;
- Appeal to private and public funders in order to maximize agency longevity;
- Provide access to new funding and other resources through the Board of Trustees;
- Foster interest and participation from the corporate sector;
- Expand program concepts and become a catalyst for new programs; and
- Make independent decisions about the future.

Perhaps the most important aspect of the new agency's independence would be its ability to plan for the future to assure program longevity. With an independent board and a long-term mandate to develop its own program and secure its own funding, the new agency would not be subject to the financial or political vagaries of another entity such as a school district or city council. Unlike other programs

[6] In the early 1990s, the term "intermediary" was not in frequent use to describe nonprofit agencies. BBEI was not originally described by its founders as an intermediary, but over time, as the expression gained currency, BBEI was increasingly referred to as an intermediary for the role it fulfilled in linking disparate groups and agencies together.

sponsored by another organization which might fade away with a change in program or budget priorities, an independent BBEI would be positioned to persist into the future.

Although the Development Agreement was still two months from its slated approval hearing at the city council, in the Fall of 1991, Bayer made a strategic move to push ahead with the concept of the new education-to-employment program by deciding to hire an independent contractor who would spend a year designing the structure of the program; it was expected that the independent contractor, if successful, would ultimately be asked to stay on as the first executive director of the nonprofit organization that would be created. Bayer anticipated that, if the Development Agreement was successfully adopted by the city council, the company would be advantageously positioned to "hit the ground running" with the core concept and program staff already in place. Bayer's decision was risky because the company had no guarantee that the Development Agreement would be approved. But the decision to move quickly also garnered several important advantages for Bayer. First, it signaled to the city and the community that Bayer was serious about moving forward with the BBEI concept [Bayer executives also felt that even if the Development Agreement were not approved – eliminating the need for an education program in Berkeley – the newly designed program could be implemented in another Bayer pharmaceutical division location such as Clayton, North Carolina.]. Secondly, it gave Bayer full control over the recruitment and hiring of the individual who would ultimately design and implement the program. Finally, it paved the way for Bayer to move forward very quickly with program development and implementation following approval of the Development Agreement, instead of getting mired in what would likely have become a lengthy process involving multiple parties to determine when, how, and what criteria would be used to hire the director of the new agency.

Recruiting efforts for this position began in October 1991 and concluded at the end of December, just one week after the city council's unanimous decision to approve the Development Agreement. The position attracted more than 90 applicants. Bayer reviewed each candidate's qualifications and invited seven people for a first interview. After meeting with an interview panel, the candidate pool was narrowed to three finalists. These individuals met with a panel of school and community representatives, and then two candidates were flown back to Bayer's U. S. Pharmaceutical headquarters in Connecticut to meet with senior Bayer management. The individual who was finally hired as the independent contractor had years of experience as a teacher and administrator in the Berkeley public schools.

When the Development Agreement was finally drafted, the 200-page document contained but two pages describing the program framework for what would become BBEI – this section was significantly placed on the first page of the community programs section of the document, giving a strong indication of Bayer's commitment to the program. The use of the Bayer funding to create a biotech training program was laid out in the broadest terms. The brevity of this section of the Development Agreement was no indication of a lack of interest, but rather an acknowledgment that structuring the organization and designing the actual program should be left to professionals with extensive knowledge in the field. The lack of detail in the document allowed opportunities for creative and flexible thinking in the creation of the new agency and the development of the curriculum. Bayer's plan to fund the creation of this new program as part of its Development Agreement, with a contribution of $1.4 million[7], paid out with declining amounts over a nine-year period, helped to generate a strong measure of support within the Berkeley community, burnishing Bayer's image and bolstering the prospect of the city's ultimate approval of the Development Agreement.

The Development Agreement specified Bayer's legal commitment to create an education-to-employment program. Though the yet-to-be-formed BBEI would be charged with undertaking this responsibility, Bayer was obligated to the city to ensure that the program was actually put in place. [In 1993, Bayer and BBEI would sign a contract which specified the obligations of each party in fulfilling the terms tied to the Development Agreement.] In the Development Agreement, Bayer committed to:

- Train students who reflected the demographics of south and west Berkeley for skilled technical positions in the biotech industry;
- Develop a "2+2" program with two years of high school and two years of community college;
- Provide hands-on, laboratory-based science classes;
- Integrate school and work over the course of the program, through mandatory paid internships for high school students, and ongoing, paid work experiences for community college students;
- Provide necessary support services to help students succeed in school and attain full-time employment;
- Set a goal to institutionalize the curriculum at affiliated high schools and community colleges

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7 Bayer's obligations in the Development Agreement involve numerous commitments related to land use, environment, traffic, etc. Within the community program section, Bayer committed to provide funding and to participate actively in numerous local programs. With regard to the section related to the biotechnology education program, in addition to funds, Bayer agreed to hire student interns and coop students throughout the course of the 30-year Agreement; Bayer additionally agreed to donate equipment, develop a stipend fund, and participate in curriculum reviews.

such that these schools would demonstrate a long-term commitment to the program, demonstrated by a willingness to hire appropriate teachers, and provide labs and equipment.

Beyond these details, neither Bayer nor the city of Berkeley – the two co-signers of the Development Agreement – made any specifications as to the nature, content, design, or requirements of the new program. The structure of the document offered the then-unincorporated BBEI maximum flexibility in designing and implementing its program. It was expected that the program would initially focus on Berkeley High School students and follow them to a local community college (It was assumed that Vista College would be the community college partner in the program due to its location in Berkeley.) Though the shape of the program was only broadly laid out, Bayer was very specific in detailing its long-term funding commitment (5-9 years), and stated that "[Bayer] envisions that its support for this program will continue beyond its nine-year commitment." Bayer envisioned that if BBEI was successful, it would grow beyond Bayer's financial support and resources. Specifically the document states that BBEI should "seek funding partners including governments, foundations, and corporations." These early clauses would prove to be highly important in BBEI's founding structure and its early successes.

After more than a year of planning and negotiation, the Development Agreement was approved by the Berkeley city council on December 16, 1991, and signed by Bayer and the city on February 20, 1992. Never before in Berkeley had a private corporation, a city government, and community leaders joined forces to approve a development agreement and never before had such an agreement specified the creation of an independent agency with a comprehensive program dedicated to providing educational and career opportunities for traditionally under-served youth.

Approximately 97% of the students who complete at least one year of the BBEI program graduate from high school, higher than the national average of 88%.

- MPR Associates Evaluation, April 2002, p. 14

Early Structural Decisions - 1992 - 1993

Key Decisions:

- Unique "birth" of mission through Oversight Committee
- Specific funding, but broad programmatic flexibility as defined in Development Agreement
- Front-loaded funding and incentive to raise additional outside funds
- No restrictions on agency growth or future direction

In 1992, after approval of the Development Agreement, a number of decisions had to be made about the new organization. These critical, early decisions would lay the groundwork for the future operation – and success – of the agency. Issues to be considered included the agency's governance structure, the mechanisms, timing, and use of early funding, program elements, and outreach activities – even a name had to be selected which would best suit the newly-formed agency. The project team ("the team") that came together to conceive a process to design and develop the new agency included a senior executive at Bayer, consultants from Fern Tiger Associates, and the independent contractor hired by Bayer. These individuals wanted to improve the educational and economic prospects of young people and were dedicated to creating a program which would fulfill these goals while maintaining the highly cooperative partnerships and inclusiveness that had characterized the broader Development Agreement process. They also recognized the importance of respecting the needs of Bayer.

Oversight Committee

In order to ensure that the new organization was formed in a neutral fashion with broad representation from the community, an Oversight Committee was convened and charged with the limited responsibilities of developing the organization's mission and bylaws, coming up with a name for the agency, and selecting the founding board of directors. "By having a founding group that was able to translate the initial concept of BBEI into a set of core principles, and in doing so, go through the birthing process, develop a personal commitment to it, and in a sense adopt responsibility for the organization's success, all of this was extremely important."[8] The 10-member Oversight Committee included the superintendent of the Berkeley schools, the chancellor of the Peralta Community College District, Berkeley's mayor, a community representative from West Berkeley, a representative from the State

[8] Former Bayer director of production and engineering and founding BBEI board member.

Office of Education, two Bayer executives, Berkeley's city manager, a member of the city council, and a labor representative. The independent contractor and the consultant from Fern Tiger Associates guided the Committee's work.

The Oversight Committee was convened three times over the course of five months. By Fall 1992, the Committee had completed its work. Among the major decisions made by the Committee relating to BBEI's mission and bylaws were the following:

- In order to avoid any perceived conflict of interest, especially with regard to agency oversight, political agendas, or financial gain, individuals employed by, or holding elective office in, the city of Berkeley or Berkeley Unified School District would not be eligible for seats on the Board of Directors.
- All board members sit as individuals: The Board would have no designated "institutional seats." (e.g., Bayer would not have a permanent seat on the board. In fact, if a Bayer employee were on the board, but left the company, he or she could continue on the Board).
- The agency would have a community- and industry-based advisory committee which would allow for "institutional" representation, since the bylaws did not permit such representation on the Board. Additionally, this committee would provide broad visibility of the program in the community as well as access to resources.

These decisions helped to support other underlying expectations; namely, that BBEI would have ties to multiple community partners, but no restrictions or limitations based on the dictates of a "parent" agency. Through this document, Bayer, alone, was legally bound to the city of Berkeley to fulfill a complex series of requirements. BBEI was bound, in turn (through a private contract with Bayer), to Bayer to fulfill particular programmatic obligations on behalf of Bayer for a period of four years. Since BBEI was not a program of the city of Berkeley, it would have no reporting requirements to the city. Rather, BBEI would have a contractual relationship with its primary funder, Bayer, for a limited number of years, and thus, would make annual reports to executives from Bayer (and later on to other funders). Bayer would fulfill its requirements with the City by making its own annual reports on all obligations related to the Development Agreement, including those related to the biotech education program. Additionally, since BBEI would not be restricted to working solely in Berkeley, over time, the agency would have the flexibility to expand to other communities.

After acting as agency incorporators, drawing up the bylaws, and finding a name for the new organization, the Oversight Committee's final task was to appoint a Board of Directors. Committee members discussed the ideal composition for the new agency's board, developing parameters which included people who understood Berkeley, who could represent the needs of industry, and those who recognized the pressures and mandates facing public school systems. It was critical that the new Board reflect the diversity of the community to be served, and that new Board members bring with them a breadth of skills and knowledge that could inform the process of developing a program which had never before been attempted. Committee members were each asked to submit the names of five potential candidates they believed to be appropriate to govern the new organization. The names of approximately 35 individuals were submitted by the 10 members of the Oversight Committee. All submissions were carefully reviewed on a range of factors: gender, ethnicity, domicile, professional expertise, community involvement, connections to the private funder community, knowledge of the biotech industry and/or the public schools, and the extent to which Board candidates have or have had children in public schools. All of this information was shared with the full Oversight Committee, which then voted their top five candidates by secret ballot. Votes were counted and the top 15 vote-getters became BBEI's founding Board of Directors. It was decided that the Board would meet four times per year, since board members were busy with other professional and community obligations. Later, the new Board determined that it was important for participating BBEI students to have exposure to and representation on the Board; two non-voting, student Board positions were created – one at the high school level and one at the community college level. Students are elected by their peers for a term of one academic year.

The Oversight Committee fulfilled one more task – determining the name of the new agency. Some committee members felt it was very important to include "Berkeley" in the name, in order to solidly identify the program with the city of its origin. Initially, the name was effective in invoking the local community where BBEI was located. Later in its development, the name would become an issue as BBEI sought to expand beyond Berkeley.

Advisory Committee

The Oversight Committee and the BBEI project team believed it was important to create a standing advisory committee to enable more expanded representation by individuals from institutions who were not represented on the Board. The Advisory Committee allowed for institutional seats for partnering entities (e.g., certain seats would be "held" by the institution, not the individual and representation would

transfer with the change in individuals at each institution). Representation included seats for the mayor, the city manager, the superintendent of schools, a school board member, the chancellor of the local community college district, and a trustee of the community college district. It was critical that these individuals and their respective institutions know and support the BBEI program and it was hoped that the committee would increase opportunities for broader community visibility, outreach, and access to resources. This committee was expected to meet once or twice a year to become informed of BBEI's program and direction, and members could be called on individually between meetings to provide counsel to the organization or executive director or, in some cases, to gain political "clout" or access as needed. Additionally, many individuals who had been named, but not selected, by the Oversight Committee for the Board were asked if they would serve on the Advisory Committee. Over time, other community and business representatives joined the Advisory Committee.

Early Funding

Those who conceived of BBEI believed it was critical in the early years for the agency to focus on developing its program and building a track record of success with its student population, instead of having to spend limited staff time on fundraising. In the development agreement negotiations with Bayer and the city of Berkeley, Bayer agreed to provide "front-load" funding in support of the new agency. A Bayer executive stated, "we agreed to fund BBEI long enough to get it off the ground. But then it would have to either sink or swim on its own merits." Bayer agreed to provide up to $1.4MM (plus an annual Consumer Price Index increase) in guaranteed funding over the first nine years (1992 to 2000) of the agency's life. The funding stream was agreed to as follows:

Year 1	$100,000 (Planning)
Year 2	$400,000 (Implementation - Year 1)
Year 3	$350,000 (Implementation - Year 2)
Years 4 & 5	$125,000 (Implementation - Year 3)
Years 6 to 9	$ 25,000 + $50,000 match (Program maintenance)

The first year was designated a planning year and funding provided for the hiring of an executive director (employed as a full time independent contractor given that the organization did not yet have legal status) to oversee implementation. Funding for the following two years was largely intended to support the launch of the program at the high school as well as planning for the program's move to the community college level. Following the first five years of the agency, Bayer's guaranteed funding dropped to

$25,000 per year. However, the company specified that if BBEI were able to locate independent matching funds, it would add up to $50,000 each year through 2000 to match outside contributions to the organization, up to a total of $200,000 over four years. The intent of this structure was to encourage BBEI to reach out for financial support beyond Bayer to funding sources in the corporate, foundation, and government sectors. In addition, there was no stipulation that funds had to be spent in the year in which they were allocated; thus, BBEI was able to roll-over funding at the end of the early fiscal years to support future program development and implementation. This design was critical in permitting BBEI to focus on program implementation without having to expend time and resources to raise an annual agency budget from disparate sources.[9] The company also agreed to pay an increased amount each year based on the Consumer Price Index (ranging from 7% to 10% each year).

In addition to the cash contributions, Bayer also made substantial in-kind donations to BBEI. From the inception, Bayer provided BBEI with professional office space, furnishings, and support (including telephones, fax, computers, etc.) at its Berkeley site. Bayer also continued to fund substantial professional time provided by Fern Tiger Associates to provide technical assistance to BBEI, whose very small staff did not have experience in nonprofit governance. Bayer also donated industry-quality equipment to the program. Initially, Bayer management indicated that these contributions would only be made for the first several years, but the company has continued to provide these in-kind donations up until the present. These non-cash contributions of office space and equipment have substantially reduced BBEI's operating costs each year, allowing the agency to devote its financial resources to the development and implementation of the program. [While the donated office space has been a significant asset for BBEI, it has also been a bit of a liability. BBEI never intended to remain at the Bayer site, but the generous donation has made it difficult to move to another, more costly, location. Over the years, many people have had trouble distinguishing BBEI as an agency separate from Bayer.]

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In 1999, Bayer sought an amendment to its Development Agreement with the city of Berkeley. As a mitigation to this amendment, Bayer agreed to provide an additional $675,000 through 2022. In this amendment, Bayer would contribute $75,000 in 2001, $65,000 in 2002, $55,000 in 2003, $45,000 in 2004, $35,000 in 2005, and $25,000 per year until 2022, the year Bayer's Agreement with the city of Berkeley ends.

97% of BBEI students pursued post-secondary education, compared to only 74% of students in nationally matched control groups.

- MPR Associates Evaluation, April 2002, p. 21

Early Program Decisions - 1993-1995

Key Decisions

- 2+1 program - focus on 11th & 12th grade plus community college
- Hands-on curriculum (with educator & industry input)
- Small class size
- Competency-based grading
- Funding for equipment (and/or in-kind donations)
- Memoranda of Understanding with school partners
- 9-part program model
- Linear program growth

Philosophically, BBEI's program fits into a long history of vocational education programs and was also an early model for school-to-career programs. The School-to-Work Intermediary Project (launched in 1999) has detailed the importance of intermediary organizations in supporting effective youth development through school-to-career programs, indicating that it is nearly impossible for school and industry partners to "interface" on their own without the assistance of an organization that brings together key stakeholders, brokers youth services, evaluates outcomes, and advocates for policies that sustain effective practices. According to an agency report, "the explosion of organizations performing intermediary roles for school-to-work activities is part of a dynamic that will outlast and transcend the catalyst provided by federal funding under the School to Work Opportunities Act of 1994."[10] Yet BBEI preceded the federal legislation for school-to-work programs by two years, and in 1992, there were few models upon which BBEI could base its new program.

During the Development Agreement discussions, the project team began substantive conversations about how the BBEI program would be structured. The team knew it would be critical to build credibility with its first academic partner, Berkeley High School, while infusing the program with the experience and "know-how" of the biotech industry.

With twelve primary schools, two middle schools, and just one comprehensive high school, the Berkeley

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10 *The Intermediary Guidebook, p.4,* produced for the School-to-Work Intermediary Project by Jobs for the Future and New Ways to Work, October 2000; updated May 2001.

Unified School District is not a typical urban school district. In 1992, Berkeley High School was home to more than 2,400 students and reflected a population diversity that was more extreme than the demographics of the city. Forty-two percent of Berkeley High students were African American, another 38% were White, and approximately 10% each were Latino and Asian. [The population of Berkeley in 1992 was approximately 103,000; 62% were White, 19% were African American, 15% were Asian, and 8% were Latino[11]] Berkeley High has a long-standing reputation for graduating high achieving students who matriculate easily to the best four-year colleges in the country. Yet, while 80% of Berkeley High students *say* they plan to go to college, the vast majority of those not enrolled in advance placement classes know little about the effort necessary to be accepted to college and lack many of the basic credentials required by most schools, even community colleges. While a total of 68% of all Berkeley High graduating seniors complete requirements for admission to the University of California or California State University systems, only 50% of Latinos and 55% of African American students complete those requirements compared to 78% of White students. Finally, many students lack the financial support to seriously consider college immediately following high school graduation. In fact, many students hold jobs requiring 20-30 hours of work while enrolled at Berkeley High. In terms of high school achievement as measured by grades, the D/F rate of African American students at Berkeley High in 1993 when BBEI began its program was more than three times the rate for White students. Like many traditional high schools, Berkeley High prepared some students very well for four-year colleges, but had little to offer non-college-bound students.

In order to begin building a working partnership with Berkeley High, Bayer's independent contractor began a series of meetings with the chair of Berkeley High's science department, who was enthusiastic and supportive of the program concept. Unfortunately, before the program was fully developed or implemented, he left the school district. As it turned out, he had not kept other Berkeley High science teachers apprised of his work on this project and, thus, Bayer and then BBEI, were faced with a high degree of suspicion from other teachers in the science department. Berkeley High School's large science department has a strong academic tradition, and faculty in the department were accustomed to developing new programs and curricula "in-house." Some were dubious about the intentions of a multi-national corporation seeking a partnership with a public high school. They feared that a company such as Bayer might come into the school with extensive financial resources, but also with a corporate agenda that was

[11] 1990 U.S. Census for Berkeley, CA; note these percentages add to more than 100% because some individuals choose to report more than one race or ethnicity.

not in the best interests of students and their educational pursuits.

While the executive director (independent contractor) worked to build relationships with individual teachers at Berkeley High School, in early 1992, she also convened a series of planning meetings with a newly created Curriculum Committee. The committee was comprised of teachers from Berkeley High School, industry representatives (including Bayer), and faculty from Vista Community College. The Curriculum committee engaged in wide-ranging discussions about the aims of the program, asking a number of broad questions: Should the program serve students who are already college-bound or focus closely on training those youth for whom college was not a likely option? How many science courses were needed in order to prepare students for a lab-based job in industry? What kinds of technical skills did the students need in order to perform in an industry lab? What kind of equipment would they need to be exposed to? How much additional support would be required to help students make it through the program?

BBEI's founders were well-aware that it would take time to develop a program which addressed these and other unanticipated questions, and that it would be important to balance the need for early program visibility with careful, linear program growth. Despite urging for early expansion of the program to other schools and communities, BBEI's founders knew it was essential to develop a successful program in one school before considering the responsibilities of managing the program in new locations. Early discussions among project team members, and later in Board retreats, the founders discussed the importance of focusing on the program at Berkeley High School, and elected not to expand until at least 1996, when a full cohort of students would have completed the entire sequence of program requirements and when BBEI would have had experience with both the high school and community college portions of the program design. This decision and the guarantee of funding provided the luxury to concentrate on the incremental and linear development of a unique school-to-work model in one location, while determining which components would be necessary for success and ultimately for replication at other schools.

The project team held numerous workshop sessions and planning meetings to discuss the structure of the BBEI program as well as the role and responsibility of each. The team looked to other community college, workforce training, and "tech prep" programs, including local programs at Contra Costa Community College and San Francisco City College. Some were merely job training programs; others

combined community college-level courses with related job experiences. None combined a high school curriculum with college-level classes and required hands-on work experience. The Development Agreement had specified a "2+2" program with two years of high school and two years of community college; given the lack of available program models, the BBEI project team would have to create their own.

Some felt the 2+2 model was important in order for students to get the maximum coursework necessary to perform in a company setting. There were debates, too, about whether BBEI students would have to pursue the full requirements for an A.S. degree at the community college level, or whether they could complete selected courses which would lead to the fulfillment of a yet-to-be-defined BBEI "certificate" authorized by the community college system and acceptable to industry. Some argued that a community college component might not even be necessary and that it could be possible to deliver all of the requisite skills within four semesters of a high school program. However, the labor union at Bayer had set employment requirements approved by the union (ILWU Local 6) which specified that skilled technicians must have successfully passed two years of college level science classes, including courses in biology, chemistry, and biochemistry. Ultimately, it was agreed that much of the training could be "front-loaded" into the two years of high school, but that students would be required to take college level science classes at a community college in order to meet the employment requirements of Bayer. The BBEI team began designing a different kind of "2+2" program – focused on the 11th and 12th grades in high school with a subsequent year at the community college, in which two years of college level science would be the focus. The curriculum would eventually comprise four semesters of specialized science classes at the high school level – including molecular biology, biochemistry, and cell culture, and training to use laboratory equipment such as pipettes, pH meters, hemacytometers, and spectrophotometers. The high school sequence would be followed by four semesters of community college science, including Introduction to Biology, Microbiology, Inorganic Chemistry, and Organic Biochemistry. In order to provide students with an appropriate level of professionalism, training in good laboratory practices (GLP) was integrated throughout the curriculum including safety measures and appropriate lab notation and reporting protocols. BBEI's curriculum committee also believed it was important to help students understand the broader ethical and philosophical debates within the biotech industry; thus ongoing topics in bioethics were woven into the curriculum.

Given that the program was intended to reach those students who were considered "academically at-risk,"

BBEI knew it would be of utmost importance to provide learning environments which would support students' success. Early on, it was determined that class size would be kept to a minimum as research had shown that smaller learning environments lead to improved student achievement due to a series of factors including smaller student-teacher ratios, increased parental involvement, decreased violence, and other factors. Many classes at Berkeley High School had upwards of 30 students. BBEI ensured that there was available funding – as well as school district commitment – to limit BBEI classes to approximately 20 students. Each classroom would be provided with state-of-the-art, industry-quality equipment and a paid lab assistant who could provide additional classroom support to both the teacher and students. Teachers knew that, even with these extra benefits, students in BBEI classes might "slide" through the classes, unless they were obligated to demonstrate what they learned in each module of the curriculum. Additionally, industry representatives had made it clear that in a professional lab setting, there was no leeway for inadequate work. BBEI mandated competency-based grading, which did not permit students to fail a class. Instead, students had the opportunity to redo their work, if necessary in the presence of a teacher, until they could demonstrate proficiency in each scientific concept or lab-based skill required for the program. Many of these elements – the smaller class size, competency-based grading, industry-level lab equipment – were highly unique to the BBEI program, and did not exist in other classrooms at Berkeley High School. BBEI knew that "special" programs within a school district could frequently be cut back or eliminated whenever there were budget cuts or changes in district administration. They insisted on a written memorandum of understanding with Berkeley Unified School District, and requested that it be reviewed annually, approved by the school board, and signed by the superintendent. This document would lay out the goals of the program, while specifying the obligations and commitments of each partner, and would become the model document for subsequent partnerships with the Peralta Community College District and Oakland Unified School District. At times in BBEI's future, these District-level MOUs would provide BBEI with powerful negotiating clout as it aimed to clarify partnership expectations while maintaining the philosophical integrity of the program.

At the same time that the Curriculum Committee was beginning to develop the structural academic components of the program, Bayer helped BBEI facilitate industry site tours for high school science teachers in order to expose them to professional biotech environments. Teachers had the opportunity to see technicians and supervisors in lab settings, leading to a better understanding of the types of skills and equipment currently in use by the biotechnology firms where BBEI students would eventually work.

Before the BBEI program components had been fully defined, BBEI's consultant determined that it was critical to launch the program with a series of summer internships (It would be called an "earn/learn" program). Though a core of the program lay in its education component and the integration of academic and workplace learning, it was believed important to build credibility and a track record – with the community, with biotech executives, with potential funders, and with the students themselves – that young people could perform on the job in the biotech sector. Additionally Bayer was willing to be a test site for the intern program. Much time and effort was spent initially in the Spring 1992 lining up a core of summer positions (at Bayer) for students. Some on the project team felt that if the students did not have the requisite academic training (which had yet to be fully developed), they would not have the tools to perform on the job. Others felt that students could perform adequately in their first summer, and that program staff would have the opportunity to "pilot-test" the internship program, gaining insights into where students were having trouble and what subjects or skill sets should be particularly emphasized in the classroom portion of the program. Nineteen students (mostly students of color) were selected for summer positions, and as they progressed through their internships that summer, it became apparent that they were gaining valuable skills and exposure, while at the same time, helping the project team understand what significant gaps would need to be filled in by the schools and by BBEI. Additionally, the interns provided early, valuable public relations appeal with the media and the community, offering evidence of BBEI's commitment and future potential for broad success (and acknowledgment for Bayer's role.)

The Development Agreement included provisions to fund a teacher intern each year (who would spend an entire summer working at Bayer.) A teacher from Berkeley High School agreed to pilot that program in the summer of 1992. In her teacher intern assessment, she noted, "I am reminded that scientific research is a dynamic and stimulating process. Workers need to know how to learn; they need to be willing to accept new ways of doing things. The experience here will remind me that the goal of education is to produce students who can think.... If I can convey this to my students, perhaps they [will] be more interested in exploring science as a career.... My work here will give me a good foundation for identifying important issues and considering ways to teach them."[12] What she didn't realize at the time she agreed to take the position, was that her early exposure to the practices and protocols of an industry

laboratory would transform her views of the for-profit biotechnology field and prove to be a crucial link

[12] *My Summer in a Brave New World*, Berkeley High School science teacher, 1992

in the ongoing development of a substantive, hands-on biotech curriculum.

As students completed the summer internships and the curriculum took shape, BBEI's founding Board met for the first time and began to articulate an underlying philosophy for BBEI which, over time, evolved into a set of "guiding principles" that have provided direction for the agency until the present day:

- BBEI is committed to serving a **target population** of youth (originally defined as encompassing the socio-economic groups represented in south and west Berkeley census tracts) often referred to as "under-served." These youth have primarily been students of color and those from low-income households.
- The **primary goal of the program is employment** in technical level jobs in science. [Advancement into four-year college is considered a success, assuming the participant was not originally college-bound when entering the program in 11th grade.]
- **Work experience** that is coordinated with the school program is a requirement for all participating students. Work experience is defined as paid, meaningful work in industry settings, not merely exposure to work environments.
- Careful **integration of the scientific work environment** should be part of the school experience. Similarly, the participating companies should provide both training and guidance that encourages performance in school and assist in creating relevant curriculum that is appropriate for the work environment.
- The organization is to be **independent of industry and of schools,** and to act to help each reform and redefine its sense of the other, and the interdependence of the two.
- BBEI will provide (or find resources to provide) **whatever support is necessary to help the target students succeed.**

At the same time that BBEI was defining its guiding principles, it began to lay out the elements of what would become an integrated nine-part model (see appendix). The model included two years (11th and 12th grade) in a high school biotechnology program, with a summer internship in an industry laboratory after the 11th grade. Following completion of the high school program, students would move into a year-long community college program (with a front-loaded science curriculum focus: four college level science courses) while working in a paid, co-op job in biotechnology, secured through BBEI. During the community college program, participants would receive job coaching and support in order to secure a

full-time, permanent positions as skilled technical workers after graduation. The program was also designed to offer extensive services to students and their families, including tutoring, mentoring, counseling, and a myriad of resources to ensure that they had the support necessary to be successful in the program. BBEI also facilitated the opportunity for teachers to participate in summer internships in industry settings so that they would develop a better understanding of the skills their students would be required to master. The program had other integrated components to guarantee its own longevity. Industry outreach was critical to build and maintain a network of companies who would provide internships and co-op jobs for students in the program, but also to foster strong advocacy for the program among industry representatives. Finally, the program included data collection and assessment of its students' progress in order to document and evaluate the effectiveness of the program.

While one or some of these elements might have been offered by other youth service or job training agencies, none were in a position to provide the extensive services matching those of BBEI. This comprehensive programmatic approach proved especially appealing to private funders who felt that by funding BBEI, they were supporting a comprehensive, integrated program.

BBEI's academic program was piloted at Berkeley High School beginning in the Fall 1992. The students who entered the 11th grade program included some who had taken part in the summer internship program that prior summer. During this pilot year, teachers wrote lectures and lab praticals, tested the lab procedures, and then presented the material to students in class. Over the next two years, as the first cohort of 11th and 12th graders moved through the high school program, participating teachers continued to implement the curriculum and adjust it based on the needs of the students and how course material "played out" in the context of the classroom. Each year, teachers met for curriculum development and review sessions to add and remove topics and scientific concepts which were necessary and relevant to the needs of the biotech industry and those that were not.

Early Outreach and Media Attention

Given its unusual birth in the Berkeley community, it was essential, as a new nonprofit, that BBEI build goodwill among community constituents, and a broad awareness in the larger community, both locally and nationally. A good deal of outreach occurred before BBEI was even created, in the form of community meetings, workshops, focus groups, and public hearings (see pp). During the Development Agreement process, early concepts for a BBEI-like program were described at numerous public meetings which were sometimes covered in the *San Francisco Chronicle*, the *Oakland Tribune*, the *Daily Cal*, the *East Bay Express*, and the *Berkeley Voice*.

After BBEI was incorporated and the independent program was underway, Bayer's public affairs consultant worked closely with BBEI's executive director to reach out to local and national media in an effort to broadly promote the work of the new agency. In the first several years, BBEI was featured in more than two dozen stories in local papers, including the *San Francisco Chronicle*, the *San Francisco Examiner*, the *San Francisco Business Times*, the *Oakland Tribune*, the *Berkeley Voice*, the *Berkeley Tri-City Post*, and the *Daily Californian*. In addition, within the first three years of its existence, BBEI's program was highlighted in an education piece in the *New York Times*, was a feature segment on *NBC Nightly News*, was covered in the *Chronicle of Philanthropy*, and had a short piece on United Airlines in-flight news video, *United Airlines in the Air*. This early coverage had significant benefits, but also some drawbacks. BBEI's coverage by highly respected national media outlets gave BBEI a cachet and a credibility profile not often associated with new organizations. The high profile coverage was impressive to biotechnology executives, private funders, and elected officials alike, often opening doors and securing meetings which BBEI might otherwise have been unlikely to get. The downside of the high-profile coverage was that BBEI appeared to have greater capacity and a deeper track record than it actually did. And, BBEI's staff and students sometimes struggled with the challenges of a new organization, and it often created more strain to do so under the spotlight of local and national media. Nevertheless, such coverage put BBEI "on the map."

Early Accomplishments

By 1995 – three years after incorporation – BBEI had attained important milestones. A two-year sequence of lab-based biotechnology courses at Berkeley High School had been established. The curriculum included skills transferable to jobs in science, health care, and the general world of work. The program was designed to tie into national skills standards, reflecting both academic and industry-driven concerns, as well as some of the social and ethical issues of biotechnology and scientific investigation.

Student enrollment in the BBEI program was a strong reflection of the communities of south and west Berkeley which the agency had been established to serve. From the start, more than 95% were students of color and more than half were women. Many of these students were the first in their family to graduate from high school, and almost all of them would be the first generation to participate in a post-secondary program. Participating students evidenced increased school attendance compared to prior semesters and were successful in making the transition from 11th grade to 12th grade, a feat that might not have happened before they became involved in BBEI. The students themselves, and their teachers, attributed their perseverance in school to their exposure to hands-on learning opportunities. Students had the chance to use the lab skills they had learned in class in professional industrial settings. This kind of learning, combined with the opportunity to earn money over the summer, were the key motivators in attracting and keeping students in the program.

By the summer of 1995, 29 students took part in high school summer internships, and a total of 75 students had participated in a summer internship. BBEI had developed an intern seminar to address work issues that students might encounter and continuously adapted it to meet the new challenges faced by interns and work supervisors each summer. To support students in their summer jobs and to inform the development and refinement of the curriculum, each summer, a BBEI teacher (from the high school or community college program) worked for a biotech company. By 1995, three teachers had completed summer work experiences and indicated that these opportunities had vastly increased their understanding of applied science and had impacted their own teaching styles. BBEI also worked with the high school science department to develop additional training sessions for other science faculty. BBEI recognized that teacher turnover was high, especially in science and math departments. By training other teachers BBEI was ensuring a pool of ready faculty who would understand the curriculum and who could provide support to help students integrate their school and work experiences. BBEI recognized early the importance of having parental involvement in the program, and designed informational materials which

explained the sequencing of the program and the educational, career, and personal benefits their children would experience in the program. Parents were strongly encouraged to help their students in any way they could.

During that same summer, as the first cohort of nine students completed the fledgling 11th/12th grade program and graduated from Berkeley High School, BBEI sent the students onto the community college phase of the program. Eight students matriculated at Vista College in the Summer of 1995. BBEI had developed a scholarship fund to assist students to pay for books and supplies, and created additional support mechanisms to ensure that these students had the tools needed to make it through the community college program. It was during that time that a number of BBEI "traditions" got their start. BBEI hosted its first graduation ceremony – a celebratory event commending student, their families, teachers, and professional supervisors. BBEI created and awarded "internship certificates" to students in recognition of their hard work. These certificates, though a small gesture, were highly meaningful to the students and their proud parents.

BBEI students who enroll at Laney College have a 67% certificate completion rate, which is more than double the national completion average for students attending non-four-year, post-secondary institutions.

- MPR Associates Evaluation, April 2002, p. 28

A Significant Stumbling Block - 1995-1996

Key Decision

- Relocating the community college program

As BBEI carefully developed and launched the high school component of its program, Vista College prepared for the college-level phase. Though BBEI staff held numerous planning meetings with Vista administrators over a two-year period, they were not closely supervising the development of the community college curriculum and program, focusing instead on the students who were in high school. As the time approached for BBEI students to move onto Vista in the Fall 1995, it became clear that the program designed by Vista faculty and administrators differed substantially from BBEI's model in philosophy, content, and pedagogical approach. As BBEI staff and Board became aware of the issues at hand, they realized they were on the verge of an organizational crisis. Fortunately, due to the framework which BBEI had worked to put in place during its start-up years – a strong Board, influential industry and community allies, and a well-documented partnership agreement in the form of a Memorandum of Understanding with the community college district – BBEI was able to make its way through the "crisis."

The California Community College System is comprised of 108 colleges in 72 independently governed districts throughout the state, enrolling more than 2.5 million students each year. It claims to be the largest post-secondary education system in the world, and California's largest workforce provider. It also attracts one of the most diverse student bodies in the state. The community colleges offer more than 175 degree and certificate programs, ranging from accounting, to fashion design, to horticulture, to computer programming. The community college system plays an important role in providing and enhancing workforce skills, frequently enrolling non-traditional, college-age students who are seeking highly specific skills for employment. The system also plays a role in providing the necessary prerequisites and credits that many students require in their pursuit to transfer to a four-year degree program; more than 60% of students graduating from California State University originated in the community college system, and more than 30% of University of California graduates started their post-secondary education in community colleges.

The state system is guided by a 16-member board of governors, however, each of the 72 districts has its own community-elected board of directors which sets local policies and provides guidance on local

issues. More than 50% of the annual budget for the community college system is subject to review and approval by the California state legislature and governor. Given the large number of independent districts with locally elected boards. The community college system is complex and fragmented: responsive to the needs and demands of local communities and industry, yet confined by the regulations and priorities established by governing bodies and the competition of other nearby districts. The system is bureaucratic and slow-moving. The Peralta Community College District includes four community colleges [Vista College in Berkeley, Laney and Merritt Colleges in Oakland, and the College of Alameda] and is represented by a 7-member, elected Board of Trustees, and two student representatives. The colleges serve the Alameda County cities of Oakland, Emeryville, Berkeley, Albany, and Alameda.

Vista College, established in 1974 as the Peralta College for Non-Traditional Study, is the youngest of the four colleges in the Peralta District. Historically, community colleges have straddled the philosophical traditions and pedagogical approaches of academia and vocational education; this peculiar position has created an underlying tension in many community college programs, including the Peralta colleges and Vista. In ongoing curriculum development meetings in the early months of 1995, these tensions became apparent, as Vista faculty and administrators insisted that BBEI students pursue a broader course of study at the community college – which entailed more academic, lecture-style courses and fewer hands-on, lab-based courses – leading to an A.S. degree. Additionally, Vista's proposed program did not guarantee small classes or competency-based grading, nor did it link academic study with co-op work experiences. Moreover, Vista did not create the integration of school and work that BBEI valued so highly for its students. While BBEI staff and board recognized the value of traditional academics, they also understood the needs of the students, and the "real world" demands of industry employers. They feared students would not stay with the program and could end up mirroring the depressing drop-out statistics of so many of their peers. BBEI's experience demonstrated that the key to learning and retention for its high school students lay in their direct exposure to the world of work, which allowed them to quickly apply the skills they had learned in the classroom and to earn money. These students had a very real need for income to support themselves, and often, other family members. The prospect of full-time, well-paid work was highly appealing to BBEI students and was cited often by students in interviews and meetings as the motivation for selecting the program. BBEI staff and Board members argued that the proposed degree-based program at Vista undermined BBEI's programmatic intent to simultaneously incorporate education and work, allowing students to learn as they worked in a supportive lab setting, and then to move into full-time technical positions as soon as possible.

In addition to these deep philosophical differences, Vista and the Peralta District faced other challenges during this same time. Since its founding, Vista had been housed at a "temporary" campus in a leased building in Berkeley. Vista's president and a group of dedicated community members had been pressing the Peralta District Board for approval to develop a site for a permanent campus. [Additionally, there were alternate proposals for Vista to secede from the Peralta District to become an independent district.] Peralta's chancellor publicly supported Vista's efforts to buy a campus property, but was voted down by a divisive Peralta Board. In March 1995, Peralta's chancellor resigned under pressure from the Board. According to the press at the time, the chancellor's defeated attempts to gain approval for a permanent Vista campus, as well as the loss of an important contract with Kaiser Permanente to locate a teaching hospital at Laney College may have been significant factors in his termination.[13] The chancellor's resignation created a degree of leadership instability for the Peralta district, including Vista. An interim chancellor from the Peralta administration was appointed.

In spite of pressure to take a position in the community college debate, BBEI wisely chose to stay clear of many of the political issues which beset Vista and Peralta; however, the lack of a permanent Vista campus led to problems with the development of BBEI's program. In order to implement the community college phase of the BBEI program, Vista administrators indicated that the program required an industry-quality laboratory, as Vista had no science laboratories. Initially, $50,000 had been designated by the BBEI board in order for Vista to develop its portion of the BBEI program. Vista had also secured a grant from the National Science Foundation to pay for program development, and hoped instead to put BBEI's funds into the development of a new laboratory facility. Vista also sought additional funding from BBEI to build out the lab. Though funding had not been designated either through the Bayer Development Agreement or by BBEI for capital expenditure uses, BBEI Board and staff, with support from Bayer management, agreed to let Vista use BBEI funds for the development of a state-of-the-art lab. Since Vista did not own property, the creation of a new lab necessitated a long-term, leased space which had to be approved by the Peralta Board. When it became apparent that negotiations for the new space had stalled and the lease had not yet been signed, BBEI staff became concerned that the laboratory would not be ready in time for the first cohort of BBEI students who were due to arrive at Vista in September 1995. BBEI leaned on its colleagues at Bayer and the Peralta district to put pressure on Vista to speed execution of the lease and completion of the lab build-out. Though the lab was ultimately completed, BBEI's

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13 *Peralta College District Chancellor Quits*, p. A13, San Francisco Chronicle, March 14, 1995

decision to relinquish funds for capital expenditures instead of program development effectively reduced BBEI's bargaining power with Vista. When discussions between the partners became more contentious in subsequent months, BBEI did not hold any financial incentives with which to pressure Vista.

When BBEI students began the Vista program in September, BBEI and Vista staff were still trying to resolve many issues, but the lab was not one of them – it had been completed and was quite impressive. BBEI students enrolled in their first semester classes, but it quickly became clear that they were having trouble. Most of their classmates were professional adults – nurses, pharmacy aides, laboratory workers – many with four-year degrees, who wanted or needed additional coursework to pursue jobs in biotech. Compared to these students, BBEI students were younger, less mature, and had not been previously exposed to college-level science classes. Very quickly, BBEI students started to fall behind. Vista provided no extra tutoring support for these students, insisting that such students probably did not belong in college classrooms, but should be in remedial classes instead. Vista's president also took the position that the co-op jobs which were meant to be an integral part of the BBEI experience should be reserved only for high-performing students – as a "reward" for their good academic work. Given the students' performance in the program, it seemed that none would be eligible for a co-op job, according to these criteria. By December, communication between the partners had become counter-productive. Following several meetings with BBEI, staff was given a mandate to investigate other institutions that could successfully design and implement the program in the place of Vista – BBEI began to "threaten" Vista that it would move its program to another community college district or a private institution.

In a final effort to mend the partnership, Vista and BBEI agreed to take part in a series of professionally, neutrally-facilitated, "vision" meetings, attended by representatives from BBEI, Vista, the Peralta District, the Berkeley school district, and Bayer to discuss each partner's expectations and desired outcomes for the program. Throughout this process, industry representatives from Bayer and faculty from Berkeley High School acted as strong spokespersons for BBEI's programmatic philosophy, advocating for the particular needs of the BBEI target student population from Berkeley High School.

These visioning sessions resulted in a series of agreements by all parties and set forth an ambitious timeline that mandated a redesign of the Vista curriculum through a series of six working sessions with Vista and BBEI faculty and a review of the new curriculum by the BBEI board; the revised curriculum

would lead to a "certificate" instead of an A.S. degree in biotechnology.[14] In addition to curriculum content, the certificate program would lay out the curriculum sequence, teaching methodologies, skill competencies to be taught, and the expectations for the integration of school courses and work experience during the year. BBEI, concerned it had already lost one year, expected to have the Vista certificate program approved by the BBEI Board and ready to be taught by Summer 1996.

In April 1996, the revised Vista curriculum was presented by Vista's President to the BBEI Board. After substantial discussion, the Board voted to reject Vista's proposed curriculum revisions, indicating that the revised program still showed evidence of deep discrepancies with BBEI's intentions and would not meet the needs of the intended student population. The BBEI Board felt that the curriculum did not clearly articulate industry-defined competencies and educational outcomes, and evidenced a continued lack of emphasis on work-based experience as a core component of the educational process.

While this course of events was frustrating and time-consuming for BBEI staff and Board members, it was especially difficult for the BBEI students at Vista, who were on the "front-lines" of the philosophical conflict. As curriculum revisions proceeded that year, BBEI students languished in large classes with older students, and were not given the additional academic support which had been envisioned by BBEI. At the close of the 1995-1996 school year, the majority of BBEI students had dropped out of the Vista program.

BBEI found itself at a critical crossroads as it decided to withdraw from its partnership with Vista. It had, however, two especially potent features which allowed it to navigate through this difficult period.

First, the board in a far-sighted decision had negotiated a Memorandum of Understanding, *not with a single college (e.g., Vista) within the District, but with the Peralta District itself.* Secondly, BBEI's ongoing efforts to build strong industry and community ties lent the agency significant credibility when staff and Board had to leverage the terms of the MOU with the District.

As the Vista partnership was unraveling, BBEI staff began discussions with other potential partners

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[14] The Development Agreement did not specify that the program must award an A.S. degree, but instead only required a "certificate of completion."

including San Francisco City College and Contra Costa College, in addition to the Peralta District. BBEI discovered that it would be very difficult to create a program which crossed over community college district boundaries, due to the bureaucratic and regulated nature of the system. In fact, as BBEI was pulling out of its collaboration with Vista, the state recognized Vista's newly-created biotech program as a degree-granting program for the District. BBEI believed that the State Board of Governors would be unlikely to approve two similar programs in one District; thus, BBEI would be forced to create a college "certificate" program instead of a state-approved degree program. Nevertheless, BBEI continued discussions with the Peralta Community College District. Given BBEI's financial resources, industry connections, a BBEI Board "mandate" to move the program, and an MOU that clearly stated the relationship with the District, Peralta's chancellor and Board were extremely interested in negotiating to keep the BBEI program within its District. By the mid 1990s, there was a high interest in the biotech industry, especially in the Bay Area, making it embarrassing for a community college to lose the support of the industry. In May 1995, following a series of high level meetings, the Peralta chancellor approved the transfer of BBEI's community college program to Laney College in Oakland and insisted that the program start that summer. Before the program could move forward though, it was necessary to consult with the city of Berkeley to make sure that the move to Laney did not violate Bayer's terms in the Development Agreement. With a new city manager in place, Bayer management held a meeting with the City to carefully lay out the case for the move. The city manager agreed that the terms of Bayer's Agreement with the city did not specify which college would house the program. The city confirmed its support for the program and its efforts to ensure the best results for the students. Following this approval, representatives from Peralta, Laney, Berkeley High School, Berkeley Unified School District, the city, Bayer, and BBEI met to confirm next steps. At this meeting, the acting chancellor of the Peralta District made it clear that the District would adhere to the terms of the MOU, and that a program would be in place by the summer.

Though BBEI's staff and board were pleased by the chancellor's approval to move the program from Vista to Laney and knew it would benefit the program in the long run, the decision created some short-term political fall-out in Berkeley. The BBEI Advisory Committee, created during the agency's early formation, comprised a number of prominent leaders of the Berkeley community. Several members of the Advisory Committee believed it was a mistake for BBEI's program to leave the Berkeley community and that it might have a negative influence on Vista and Bayer; they were upset that they had not been consulted before a decision had been made. It became clear that the role of the Advisory Committee had

never been properly defined. BBEI never intended for the Advisory Committee to make policy decisions for the agency and thus, had not consulted them on the Vista matter. BBEI board and staff members met with several members of the Advisory Committee to rectify the misunderstanding.

Very quickly, BBEI established a working relationship with faculty and administrators at Laney, in order to have a class in place by July – a mere two months to prepare. To get the program started at Laney, BBEI's board and Laney administrators agreed to hire BBEI's program coordinator (a former Berkeley High School science teacher) on a temporary basis to teach the summer classes to incoming BBEI students. The teacher not only became committed to teaching the summer classes, but began acting as an informal liaison for the BBEI program – communicating with Laney faculty and sharing useful information with BBEI's board and staff. Though not initially planned, this "liaison" position was extremely helpful in enhancing articulation of academic coursework as well as communication between the partner organizations. BBEI's Board elected to make the liaison teaching position integral to the program, which has continued into the present day.

Industry employers say BBEI graduates outperform their peers at work, and supervisors note that BBEI graduates possess significantly greater technical skills than their peers including familiarity with laboratory equipment and processes, familiarity with computer applications and instrumentation, and the ability to learn new processes.

- MPR Associates Evaluation, April 2002, p. 32

Program Expansion - 1995 - 2001

Key Decisions/Events

- Funding beyond Bayer
- Expansion to Oakland
- Strategic regional growth

New Funding for BBEI

In early 1995, as BBEI was still fine-tuning the program and the organization's structure, it approached the Haas Jr. Fund, about funding possibilities for the coming years.[15] Haas expressed interest but also confusion, about BBEI's program. The Haas Fund had been approached for funding from several of BBEI's partnering organizations, each claiming to be implementing a unique, new biotech education program. Haas' program officer was unsure about who "owned" the program and what the different partners were trying to achieve. To gain greater understanding of the new biotech initiative, Haas convened a meeting with BBEI and program officers from three other foundations: The Irvine Foundation, the Cowell Foundation, and the San Francisco Foundation. In addition, Haas invited representatives from Berkeley Unified School District, Vista College, the Berkeley Community Fund, and the city of Berkeley. BBEI suggested an industry representative be at the meeting as well, and a Bayer vice president participated. During the course of the meeting, it became clear that BBEI "held the keys" to the program. Its comprehensive nine-part model encompassed *all* of the components that were being offered by BBEI's partners. All but one of the program officers realized that in order to fund the "full" biotech program, it made the most sense to make a grant, not to BBEI's partners, but to BBEI itself. Following that meeting, three of the four foundations invited BBEI to submit funding proposals. Through this process, BBEI was granted more than $500,000 to be disbursed over the course of three years. These grants represented the first efforts on the part of BBEI to garner private funding beyond the Bayer monies. This early successful fundraising would later build BBEI's reputation and credibility among the close-knit Bay Area funding community, leading to additional grants from other private

foundations and securing Bayer's matching funds of $200,000, beyond its initial commitment. Between

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15 BBEI had been extremely cautious about spending funds, enabling the build-up of large reserves which were carried over each year. But Bayer's funding would begin to decline and BBEI needed to reach out for new monies. BBEI was confident of its potential for success with its program and therefore prepared to approach the philanthropic community. BBEI also wanted to ensure that it could raise funds to match the additional $200,000 committed by Bayer.

1995 and 2001 BBEI secured more than $1.5 million from private foundations.[16]

Expanding Beyond Berkeley

As BBEI staff and Board members were engaged in exhaustive discussions with Vista and Peralta, they were also pursuing ambitious plans to expand the program beyond Berkeley. Early BBEI Board retreats had examined the founders' vision for growth, contemplating what the agency's long-term future might be (e.g., one of the topics considered was *"Life for BBEI After 2000")* and how the agency could effectively provide educational and career opportunities to more youth beyond Berkeley and beyond Bayer's funding. To move forward with expansion plans, BBEI submitted a proposal to the Cowell Foundation – one of the funders at the meeting convened by the Haas Fund. The Cowell Foundation had been impressed with BBEI's desire to expand the program and awarded BBEI a grant of $150,000 for three years to replicate its program in a yet-to-be-named high school in the Bay Area.

In December 1995, BBEI issued a Request for Proposals (RFP), inviting public schools within a 20-mile radius of Berkeley to submit an application detailing how they would develop, implement and later, sustain a biotech program in partnership with BBEI. BBEI held a "bidders' conference" for interested schools to describe the program and the selection process; eleven high schools sent representatives to the conference.

BBEI's criteria for "ideal" proposals were extensive. The selected school would have to evidence a strong commitment to the BBEI program, mission and philosophy. Key staff and administrators at the school needed to demonstrate that they had the institutional infrastructure, as well as the skills and academic knowledge to develop and teach a biotech curriculum. The school should be situated in or near a biotech corridor, so that BBEI could find internships for students not too far from their home community. And, finally, the school had to possess the student demographics that BBEI was targeting – namely students of color and those from low-income families.

Seven schools from three school districts submitted proposals; represented school districts included Hayward, West Costra Costa, and Oakland. In April 1996, after an exhaustive review of all of the

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In addition to funds from foundations, in 1998, Chiron Corporation sought a development agreement with the city of Emeryville. In mitigation discussions with neighboring communities, Berkeley requested funding for BBEI. Chiron agreed to payments of $20,000 per year over a 10-year period commencing in 2000. In addition, BBEI was to receive additional funds totaling $675,000 through the amendment to Bayer's development agreement (see footnote 9).

proposals, including site visits and individual interviews with three finalist schools, the BBEI Board voted to approve program expansion to Fremont High School in Oakland. Fremont was selected due to evidence of strong leadership and teamwork among teachers and administrators, a clearly articulated implementation plan, an academy-style class structure which fit well with the BBEI program, existing connections with Kaiser Permanente, a local hospital (through which BBEI hoped to develop internship opportunities), a demonstrated readiness to implement the biotech program beginning in the Fall 1996, and most important, a student population which specifically met the criteria of BBEI's target audience. In 1996, Fremont comprised approximately 44% Latino students and 40% African American students out of a total enrollment of 1,500. Though over 95% of students finish their 12th grade year, less than 18% of those graduates complete the requirements that make them eligible for enrollment in the UC/CSU systems.[17]

The expansion to Oakland was a challenge for several reasons. The three-person BBEI staff was already stretched thin that year dealing with issues relating to Vista College and the transfer of the community college program to Laney. The development of a new community college program at Laney went smoothly, but took a great deal of staff time. In addition to BBEI's lack of visibility in Oakland, its close alliance with Bayer over the years had given it a reputation in many circles as a "Bayer program" which developed employees just for Bayer. Compounding these issues, the move to a large, urban school district such as Oakland's necessitated building new relationships and visibility with educators, the business community, and local elected officials. BBEI had little prior exposure to the Oakland school district or the larger community; its board was heavily Berkeley-based as was the advisory committee. In terms of students, Oakland Unified was at least five times the size of Berkeley, and had a much higher population of African American and non-native English-speaking students. At the time, the District was in crisis: Student absenteeism and dropouts were at an all-time high, school facilities were in poor condition, campus safety had declined, and three superintendents had cycled through the position in recent years.

To build connections in Oakland, BBEI staff determined that the new program at Fremont would benefit greatly from the guidance of a community-based "resource committee." Such a committee would build

[17] California Department of Education, Student Enrollments and Graduates by Ethnicity, School Years 1996-1997, www. cde.ca.gov

community visibility and credibility. In fact, BBEI envisioned that as it expanded to new districts, over time, each school would have its own resource committee. The committee in Oakland included members of the school district's Board of Education, a representative from Kaiser Permanente, and leaders from local nonprofit organizations based in the neighborhood surrounding Fremont. (Invitations to Oakland's mayor and city manager did not result in high level participation.) The committee met only twice. [After a period of time, BBEI decided that the committee did not have a clear mandate, and could become an extra administrative burden for staff. Committee meetings were discontinued.] Instead BBEI chose to increase the membership of its board and to seek Oakland-based board members.

In spite of the challenges of expanding the program to Oakland, after the first year, 26 11th graders from Fremont High School participated in summer internships at fourteen different biotech companies. Several years after its expansion to a new school, BBEI was serving almost 150 students annually; 50 students had internships in biotech companies and nonprofit settings; 27 students were participating in full-time co-op jobs; and more than 25 students were graduating from the community college phase of the program. BBEI had expanded its industry partnerships from just one at its founding to more than 35 institutions representing private biotech companies, nonprofit health clinics and hospitals, and public sector agencies; over the course of time, BBEI had formed relationships and made student job placements with 57 employer partners in the Bay Area. In 1998 at a Jobs for the Future conference, BBEI was recognized by Johnson & Johnson as a model for industry and education partnerships offering a "pioneer health career training program."

Strategic Planning

In 1999, after the successful, but exhausting, expansion to Fremont High School and the transition to Laney College, the founding executive director decided to leave the agency after seven years. The Board conducted an executive search and hired a new director. Once the new executive director was fully ensconced, the Board determined that, following a period of rapid growth and transition, BBEI had reached an appropriate point for long term strategic planning.

The subsequent process represented BBEI's most extensive efforts to take a long-range view of its core program, its partnerships, its funding base (which was increasingly focused on foundations, development agreement commitments, and a three-year NSF grant awarded to Laney in conjunction with BBEI) community outreach, and its opportunities for new initiatives. The strategic planning effort was

especially important as BBEI planned for its second decade of supporting underserved youth.

Though Bayer's obligations as stated in the Development Agreement, to train youth through BBEI's program legally came to a close in 2000, BBEI as an independent organization did indeed have a life beyond 2000 and beyond Bayer. At numerous retreats, Board and staff members discussed which segments of youth BBEI should serve and how it could be most effective. BBEI examined topics such as *"Who is a BBEI student"* and *"BBEI: Life after Bayer."* Board members wondered whether students who took part in BBEI, but then dropped out, should still be considered "BBEI students" and benefit from available services. They also discussed whether BBEI could have a role with younger students by expanding the program *downward* into middle school in order to capture students at a vulnerable age before they even got to high school. As for BBEI's existence after Bayer's funding tapered off, it had always been the intention of the founders to make BBEI a self-sustaining organization beyond the funding that Bayer provided. The funding streams which BBEI had begun to tap from private foundations in 1995 were just the beginning of what could become fully diversified revenue from foundations, corporations, and individuals.

Many board members, and funders as well, had been pushing for BBEI to grow. They shared the urgent feeling that BBEI's unique program could be expanded to serve many more youth similar to those in Berkeley and Oakland. Yet, BBEI staff had been resistant to growth over the years – particularly in light of the organizational strain they experienced with the expansion to Fremont High School. They felt it was important to have a high quality program and that too much expansion too quickly put undue stress on the staff, which was then passed on to the students in the program in the form of less time for mentoring and support, for curriculum development, or to secure summer internships. These issues continued to provoke discussion among BBEI staff and board, and became a central part of the strategic planning process which BBEI began in early 2000.

To facilitate the planning process, BBEI turned to its long-time consultants, Fern Tiger Associates. The process involved a comprehensive analysis of board, staff, and constituent priorities for the organization and was informed by a number of evaluative measures. The consultant conducted in-depth, one-on-one interviews with numerous internal and external stakeholders, including staff, board and advisory committee members, school district administrators, state community college representatives, teachers, program participants and graduates, industry representatives, and funders; held a series of focus groups

involving BBEI students, the advisory committee, as well as community leaders; circulated a written board survey; conducted a content analysis of BBEI press coverage; researched "competing" programs focused on youth development, education-to-employment, science education, and support for at-risk youth; and reviewed the demographics of local and neighboring schools and districts.

Following numerous planning committee meetings, the board engaged in two, day-long retreats to review and discuss the findings, recommendations, and goals that became the core focus of the strategic plan. These engaging sessions provided board members with the opportunity to examine a range of issues and options for the agency to pursue over the coming years. Once the thorough, two-year assessment of the organization's strengths, challenges, and future opportunities was completed, BBEI's board and staff approved and adopted the agency's first strategic plan in January 2002. The plan set forth six major goals to ensure the stability and future strength of the organization, supported by a series of subgoals, objectives, proposals for action, and strategies for organizational management. The plan drew on past successes and focused on options:

- to strategically expand the organization's capacity to serve more youth;
- to deepen BBEI's commitment to underserved youth;
- to expand and enhance bioscience industry partnerships, as well as partnerships with community institutions, schools, community colleges, and teachers;
- to advocate for education-to-employment as a component of effective school reform; and
- to strengthen BBEI's management and fiscal capacity to secure the organization's future.

Given BBEI's careful development through its start up years and the skepticism toward growth by some staff members up until that point, the Board's unanimous determination to expand the agency was one of the most significant decisions arising from the strategic planning process. As part of its program expansion, BBEI planned to conduct a thorough analysis of other expansion program models, analyzing best practices as well as mistakes to be avoided. BBEI would also conduct focus groups and individual meetings involving school board members, school district administrators, community college leaders, local biotech industry representatives, teachers, students, parents, and community-based groups in school districts targeted for growth. The overarching strategy was that it would be important to grow incrementally – first to a third local high school, then to a new community. Targeting initial growth to a third high school in northern Alameda County would increase BBEI's presence within the Peralta Community College District. This could be followed by a partnership with another community college

in order to create a complete cohort of high school and community college students in a new region within the Bay Area. In the longer term, the Board hoped expected to lay plans for more extensive expansion.

Evaluating Success - 2000 - 2002

At about the same time that BBEI was engaged in its strategic planning process, several more cohorts of BBEI students had made their way through the high school and community college program. BBEI Board and staff felt it was an important moment to conduct an independent evaluation of the success of the program.

Earlier in BBEI's development (in 1996), Bayer had funded a consultant to conduct a qualitative assessment of BBEI's program effectiveness. At that point, only one cohort of students had progressed through the entire program sequence, thus it was not possible to make comparisons or draw statistically meaningful conclusions about the program. By 2000, four cohorts of students had gone through the full three-year program (once the community college program had been moved to Laney). BBEI staff had been routinely collecting basic data about the students (GPA, job positions, performance reports by work supervisors, etc.) and believed they had enough information to begin making an assessment of the program.

With grant funding from the Irvine Foundation, BBEI contracted with a Berkeley- and Washington, DC-based evaluation consulting firm, specializing in research and analysis of K-12 and post-secondary education. The evaluators designed a two-year evaluation process which had at its core a rigorous, statistical framework that used national secondary and post-secondary databases from the National Educational Longitudinal Study (NELS). NELS data was used to create control groups against which BBEI students could be compared to assess with statistical confidence whether BBEI program participants did better than comparable students not in the program on a range of outcome measures, including successful completion of science classes, academic performance as measured by grade point average, graduation from high school, and enrollment in, and completion of post-secondary education. In addition to this quantitative analysis, the evaluator conducted focus groups with students, a discussion session with parents of program participants, and a survey of employers of BBEI students and program graduates. Some of the major findings provided strong indicators of program success:

- Approximately 97% of the students who complete at least one year of the BBEI program graduate from high school, higher than the national average of 88%.
- 97% of BBEI students pursued post-secondary education, compared to only 74% of students in nationally matched control groups.
- Industry supervisors indicated that BBEI students who received an "excellent" performance

rating increased to approximately 70% at their final review from approximately 50% at their initial review, evidencing significantly improved performance on the job. Employers also indicated that BBEI students demonstrated increased technical skill proficiency as well as enhanced professional judgement and maturity.

- Students cited the co-op job component as one of their favorite parts of the BBEI program, allowing them to put into practice the scientific knowledge and lab skills they had acquired in school, while earning money at the same time.
- Almost 67% of BBEI students who enrolled at Laney College earned a Certificate of Achievement in Biotechnology – a completion rate significantly higher than the national completion average of 30% for students attending non-four-year post-secondary institutions.
- In focus groups, many students indicated that they would have been unable to make it through the program curriculum without the personal support offered by BBEI.

Other findings pointing to the need for continual program assessment and improvement included:

- Faculty at Laney College, as well as students themselves, indicated that BBEI students struggled with course material in the post-secondary segment, in spite of solid scientific and laboratory preparation at the high school level. Some of this may be attributed to the fact that most BBEI students are several years younger than their counterpart classmates at the community college.
- More than 30% of BBEI students chose not to pursue the BBEI Certificate program at Laney College, but went on to other two-year college programs (12%) and four-year institutions (21%). While any student who chooses to continue his/her education is considered successful, the issue raised the question of whether BBEI was reaching its intended population of academically at-risk students (would those students have pursued post-secondary education *without* the BBEI program?).
- Many BBEI students at Laney cited frequent exhaustion as they put in long hours to balance the requirements of school work, studying, co-op jobs, and the demands of personal and family lives (which sometimes necessitated a second paid job, beyond the co-op position.)
- BBEI staff noted that it sometime took BBEI students up to two years (instead of one) to complete the Certificate program at Laney, some of which may have been due to difficulties in balancing school and job workloads.
- Industry employers, while impressed with many of the BBEI students' skills, cited concerns about math and writing skills, and the need to emphasize basic computer software programs.

- More than half of BBEI program graduates had been offered positions at Bayer Corporation. To some extent, this is understandable: Bayer has more production jobs in the Berkeley/Oakland area than other biotech companies who use their Bay Area locations for research and do production in other locations. And Bayer has extensive obligations in the Development Agreement with the city of Berkeley to hire Berkeley residents. However, BBEI struggles with the perception that this program is a "Bayer program."

In focus groups, many students indicated that they would have been unable to make it through the program curriculum without the personal support offered by BBEI.

- MPR Associates Evaluation, April 2002, p. 34

BBEI at a Crossroad - 2002 and Beyond

Key Events

- BBEI's Oakland program moves to Life Academy
- Education and industry management changes
- A new Executive Director is hired

After almost a decade, BBEI has advanced through the program start-up phase. It has successfully graduated six cohorts of students from its Laney College certificate program and serves approximately 150 students annually. Following a strategic planning process, the agency will begin examining new options for program expansion. In spite of these successes, however, BBEI is faced with new challenges as it moves into its second decade. Some of these challenges are due to ever-fluctuating factors in the school and industry environments where BBEI works; yet others stem from internal changes at BBEI.

The Move to a New School

In May 2000, in response to research indicating that smaller learning environments aid student achievement and as part of a movement to improve Oakland public schools, the Oakland Unified School District (OUSD) launched a small schools initiative. The initiative called for the development of ten, new, small schools over three years. A group of BBEI science teachers from Fremont High School became excited at the prospect of forming a small learning environment and felt that the BBEI program would thrive in such a setting. The teacher team was selected by OUSD to form the LIFE Academy.

OUSD's selection of the BBEI/Fremont team caused both excitement and consternation. To a certain extent, the teachers had progressed in the application process without fully informing the BBEI staff and Board of the efforts. When the Board learned of the team's nomination to develop the new school, it was too late to back out of the process. BBEI's board faced yet another decision: Should it keep the program at Fremont where it had a long history or should it elect to move the program to Life Academy, to follow most of the seasoned science department? The Board had some concern about Life Academy. Although its small size and committed teacher corps could provide a positive learning environment, its college preparatory focus could alienate the type of student that BBEI was meant to support – those for whom college was not necessarily an option, due to grades, finances, family situation, personal motivation, and other factors. After extensive discussions between the design team and the Board, BBEI decided to officially move the program from Fremont to Life Academy. Following a year of planning, 54 11th and

12th grade students from the BBEI program at Fremont High School moved to the new school in the Fall semester of 2001. It is too early to know the long-term results of the move, but BBEI's board and staff are monitoring progress closely.

Partnership Changes

Since 1992, BBEI has negotiated with five different school superintendents and seven principals in both the Oakland and Berkeley school districts, and has worked with three chancellors of the Peralta community college system and four college presidents within that District. Faculty at the community college level – who are not tenured and are often not even full-time – change each year and sometimes even each semester. BBEI has also lived through three city managers in Berkeley and six site management changes at Bayer. As the biotechnology industry has continued to mature, each of its industry partners has gone through countless corporate restructurings, mergers, and human resources reassignments in response to broad economic shifts and company-specific demands. To a certain extent, these changes are to be expected, however, BBEI continues to face the challenge of maintaining relationships with these education, industry, and community partners.

New BBEI Leadership

At the start of 2002, and just as the Board approved its aggressive plan for growth of the organization, BBEI's second executive director informed the Board that she planned to move closer to her home and family. BBEI found itself, once again, looking for a strong leader. In order to ensure that the leadership transition process was smooth and did not interrupt the ongoing program, the Board developed an executive director transition process, which included temporarily contracting with the founding executive director to step in as acting executive director. The Board's executive committee interviewed a series of candidates, and finalists had the opportunity to meet with BBEI staff , current BBEI students, and a panel of educators representing BBEI's partners. The decision was a complex one, as the Board assessed the range of candidate skills and experiences, including commitment to the nonprofit sector, experience in the biotech industry, understanding of workforce development issues, knowledge of the local Bay Area community, and strong management and administration skills. Once the Board had narrowed its candidate pool, it was faced with the decision to hire an individual from outside the region. The decision was weighed carefully in light of cost and relocation issues, and the fact that the candidate was not familiar with local educator and business communities. After deliberations, the Board offered the position to a talented educator, manager, and leader from Alabama. She joined BBEI in July 2002.

Lessons Learned

The birth and development of BBEI occurred at a unique moment in an unusual city. Through its innovative program and partnership structure, BBEI developed a comprehensive education-to-employment model which has shown demonstrated effectiveness with hundreds of students. As it plans to further build and strengthen its program and organizational infrastructure, BBEI continues to examine important issues which will influence the organization's future and its impact on young people and on industry. Could another organization like BBEI be successfully started today, and if so, what lessons from BBEI's development would help contribute to the success of a new agency?

Relationships with Schools

- *Develop formalized relationships at the district level.* From its inception, BBEI sought memoranda of understanding with partnering school and community college districts which laid out the expectations and obligations of each partner. The MOUs were intentionally executed at the district level instead of with individual sites. This approach afforded BBEI credibility at the district level and offered some degree of flexibility and leverage when BBEI felt a partner was not fulfilling agreed-upon expectations, as in the case of Vista College.

- *Build and maintain ongoing relationships with teachers, college faculty, and other academic administrators.* Beyond the district-level MOUs, BBEI built strong relationships with site level personnel: teachers, community college faculty, and other school administrators. While some BBEI teachers remained in place over long periods of time and became extremely familiar with and committed to the program, teacher and administrator turnover in public high schools and community colleges is generally high. To ensure that faculty and administrators understood the intent of the program and to provide support for ongoing programmatic issues or problems, BBEI staff met regularly with teachers – in curriculum planning discussions, one-on-one coaching meetings, and program review sessions. BBEI also offered an orientation to new teachers on th BBEI program, its philosophy and its track record. By building relationships with teachers, BBEI could make sure that the program was reaching intended students and that the teaching methods and course content were consistent with BBEI's philosophy and mission. In turn, teachers felt supported and knew they had a BBEI staff resource if they ran into difficulties.

- *Provide teachers with exposure to industry settings.* BBEI's early discussions with industry representatives and teachers confirmed wide differences in priorities, attitudes, and motivations. BBEI knew it would be important for teachers to gain exposure to industry settings. Such exposure would inform teachers' development of BBEI coursework and teaching methods, while hopefully reducing historical educator suspicion of the corporate sector. BBEI initially had funding from Bayer for the summer teacher internship program and sought other industry support to provide additional teacher internships in industry.

Partnerships with Industry

- *Get management support and "buy-in" from the highest levels, while building loyalty from line staff.* BBEI's relationship with Bayer was unusual from the start, given its historical context of the Development Agreement. Nonetheless, the support BBEI had from senior levels of management at Bayer gave it unique strength, community credibility, and access to resources (including financial support, donated office space, internships for students, etc.). Since corporate turnover was high (as in public schools), it was necessary for BBEI to make continual efforts to share the BBEI program with Bayer executives to maintain understanding and support for the program. When BBEI moved beyond Bayer to seek corporate partnerships with other biotech companies, it aimed to make connections with high level decision-makers. BBEI believed it was important for top management to understand the business rationale for hiring BBEI graduates, instead of viewing the summer internship and co-op program as a "charity cause." However, BBEI did not forget to build relationships with supervisors and other line staff who could advocate for the program and for additional students.

- *Ensure close proximity of an industry base.* The BBEI program relies heavily on the availability of meaningful summer internships and co-op jobs in the biotech industry for its participating students. Companies which are located in or near communities where BBEI students live (and go to school) are likely to have a greater commitment to providing job opportunities for BBEI students. Similarly, nearby companies reduce the commute time for busy students, creating less stress in their already busy schedules. BBEI was faced with this issue when it expanded the program to Fremont High School in Oakland. Oakland did not have a large biotech employer base, making it difficult to secure large numbers of intern and co-op opportunities in Oakland. Though BBEI has continually secured enough jobs for all participating students, students have

sometimes had to make long commutes to their jobs. As BBEI assesses the possibility of expansion to new schools and communities, it must investigate the presence of industry employers who are in a position to offer the types of skilled technical jobs for which BBEI prepares its students, keeping in mind that the student populations that BBEI serves often come from neighborhoods which do not support an extensive industry base. In those cases, BBEI must be prepared to offer or subsidize transportation for BBEI students who must commute to their jobs.

- *Develop and maintain industry outreach efforts.* Due to continually shifting business priorities and changes in management structures, it has been a challenge for BBEI to build lasting partnerships with many start-up biotech firms. Additionally, many small firms claim they do not yet have the production need or the personnel budget to hire many skilled technicians, the types of jobs for which BBEI graduates are usually eligible. BBEI has made it an ongoing priority to develop new relationships with biotech companies and has also broadened outreach efforts to include nonprofit and public sector agencies with a science-based focus, including health and environmental protection.

Working with BBEI Students

- *Ensure small class size with extra teacher support*. Research has shown that small class size can be extremely beneficial for all types of students by providing a low student/teacher ratio, allowing for more focused attention on individual students. Given that many BBEI students had previously had academic troubles and that the BBEI science curriculum was apt to be challenging, the BBEI classes were intentionally limited (approximately 22) in order to provide support for its students. BBEI also had an extra classroom assistant who provided backup support to the instructors as well as after-school tutors who provided mandatory tutoring for all BBEI students. [Initially Bayer provided funding for the teacher's assistant and tutors; later, BBEI raised program funds from other private sources to pay for these important student services].

- *Offer a hands-on curriculum and competency-based grading.* Many of the students in the BBEI program had not previously been successful with more traditional academic approaches. BBEI designed a lab-based curriculum which emphasized hands-on experiments grounded in industry practice, rather than theoretical lectures. The program eschewed traditional grading procedures

for a competency-based grading system which required students to repeat their work until they received an A or B. BBEI students benefitted from the opportunity to perform hands-on lab procedures repeatedly, which permitted students to truly master what they were learning rather than sliding through abstract lectures on scientific principles.

- *Link academic courses to paid work experiences.* Most BBEI students indicated that they were motivated by the opportunity to earn money. Some had to help support their families, while others wanted "extra cash" or sought economic independence. Many of these students did not feel that school work had much relevance – economic or otherwise – for their lives. Yet, by directing linking the biotech coursework to paid jobs in industry, BBEI offered students the motivation to pursue their studies by demonstrating the direct connection between academic studies and the world of skilled, paid work. Students surveyed as part of BBEI's independent evaluation indicated that the paid work experience was one of the most valuable aspects of the program.

- *Provide ample support services for students.* The students chosen for the BBEI program frequently had challenges beyond the merely academic. Some had language or immigration difficulties, others had complex family situations, still others had pressing economic circumstances. Though the BBEI program was primarily designed to fulfill academic and career preparation demands, the program founders realized that if students were to make it through the program, they would need other types of support. BBEI's built-in tutoring, mentoring, career counseling, and parent outreach services were critical to the success of its students. BBEI also provided referrals to other social service agencies for its students who were experiencing problems which BBEI staff were not equipped to address.

Demonstrate and Promote Program Success

- *Document and share program outcomes.* Over the years, BBEI sought funding to conduct independent evaluations of its program. Though the evaluations were time-consuming, they served several purposes. First, they provided important insights to BBEI about the effectiveness of the program for its students, allowing BBEI staff to make changes and adjustments to strengthen the program. Evaluations also played a role in demonstrating to funders the successful results of the program which bolstered the case for additional funding to support current program

operations and future expansion efforts. Finally, these independent assessments could be used to convince industry partners about how the program could make a difference in students' lives while at the same time helping to develop a skilled and productive workforce.

- *Continually describe the program through its multiple communities: schools, industry, and community.* BBEI continually focused on its three audiences and three-part mission: to encourage and create student success in science; to guide industry to recognize the value of young people and to prepare them for employment; and to maintain the values and support of the community. In many ways, BBEI made this real: through award dinners that honored each of the three sectors; through board and advisory committee composition; etc.

- *Seek high visibility media coverage.* From the outset, BBEI made contact with media representatives to share compelling student stories. These efforts resulted in both local and national coverage in print and television media which provided BBEI with broad visibility and name recognition. This media coverage gave BBEI added credibility when it sought support from new school partners, industry representatives, new funders, elected officials, and other community leaders.

Strategic Organizational Management

- *Ensure broad, diverse agency representation.* Given that BBEI was structured as an intermediary that straddled multiple sectors and communities – including high schools and a community college, school districts, industry partners, and the students themselves – it was important that agency representation through the board of directors and advisory committee represent these diverse stakeholders. BBEI made sure that its board included educators, healthcare professionals, biotech executives, labor experts, community representatives, and students. In time, the composition of the board also took into account gender and demographic balances which represented the communities BBEI was serving, and included individuals with functional skills such as finance, legal expertise, and marketing. The advisory committee was even broader, including school superintendents, elected officials, and city representatives among others. Over the years, this broad representation gave BBEI stability and credibility with industry representatives, school district administrators, and within the communities in which it operated.
- *Develop diversified program funding base.* BBEI was founded with the exclusive and very

substantial financial support of one contributor: Bayer. Start-up and roll-over funding allowed BBEI to focus on program development rather than fundraising in the early years. Several years after its start, BBEI successfully sought funding from major, private foundations as well as select corporate funders and contractual reimbursements through the National Science Foundation and local school districts. The agency has realized that these efforts to diversify funding sources must continue with renewed efforts to seek corporate support. Additionally, in spite of the fact that there are few likely donor prospects among BBEI's target population, efforts must be made to develop an individual donor base by reaching out to people with both the financial resources and a commitment to aiding the types of young people benefitting from BBEI's program.

- *Consider agency expansion carefully.* BBEI developed its initial program in a linear fashion, beginning at Berkeley High School and then expanding into the community college phase. Once a full cohort of students had made it through the program, it expanded to its second site at Fremont High School. BBEI chose Fremont following a thorough review of numerous school proposals, but in spite of intentional planning, the move to Oakland put additional stress on the small agency. Each new program site necessitates developing new relationships with administrators, teachers, and students as well as building relationships with a new school district and local community institutions– stretching the span of BBEI's management capabilities. BBEI has learned that, when considering expansion, it is important to balance the needs of current students and program partners with a vision for how the agency can best grow to reach additional young people who would benefit from the program.

Even as BBEI examines what it has learned about the needs of its participating students, about the strength of its partnerships with biotech companies and educational institutions, and about the requirements for its agency infrastructure, the board and staff continue to raise pressing questions about the agency. How can BBEI teach students to overcome the anti-achievement culture of many urban schools? Should it play a deeper role in local school reform efforts? Can it have a lasting impact on corporate managers' views of productive workforce development? How can the agency be more effective as an intermediary? And finally, what is the most sustainable way to expand BBEI's program in order to reach more deserving young people? BBEI will engage its board, staff, agency partners, funders, and other community leaders to address these and other questions in the coming years. As BBEI addresses these questions, the agency recalls the vision of Karl Duchardt, a Bayer senior executive and one of

BBEI's founders, "My dream for students in this program is that they will demonstrate that the additional education they get, the additional preparation for the job they get will make them extraordinary candidates for positions within the biotech industry, and that I see students coming out of the program really advance in their careers, beyond what we had in mind when we first started creating the program."[18]

[18] Karl Duchardt, former senior vice president for production and engineering at Bayer's pharmaceutical division in Berkeley

Nine-Part Program Model

1. **High School Program** with a specialized curriculum, guided by collaboration between education and industry, including appropriate teaching styles and evaluation of student performance.
2. **Paid Summer Internships for Enrolled High School Students** to obtain real employment experiences in positions similar to jobs they would secure following completion of the program, and practice in skills required for getting and keeping a job.
3. **Community College Program** with appropriate certificate of completion and definition of skills acquired and mastered; curriculum and hands on experiences guided by educators and industry; articulation between high school and community college programs.
4. **Paid Teacher Internships in Industry** address the lack of experience and exposure by public school teachers with industry needs and skills; teacher training in specific biotech curriculum and related social, political, and ethical issues of biotechnology and/or industry driven concerns expressed by teachers.
5. **Co-op Employment Experiences for Community College Participants** to enable year round work experiences for students advancing in the program through contract relationships of students with BBEI and participating companies to assure direct linkage between work and school.
6. **Job Placement** services including employment development, preparation and counseling for interviews, as well as other support to assist in transition between training (school) and work.
7. **Industry Outreach** to continually expand the engagement of industry to work with BBEI and to education/industry collaboration in training (through the commitment of intern and co-op placements.
8. **Support Services** for participants and families (including mentoring, tutoring, counseling, and facilitation of family understanding of work experiences) that "close the gap" between current support mechanisms and those needed to achieve successful completion of program and employment. (In general, this category includes all aspects of BBEI staff and resources necessary to ensure that all program participants succeed in completing the BBEI program).
9. **Evaluation** of program and all components; ongoing data collection and tracking of participant outcomes.