Students, Technology and Everyday Life

A Report Prepared for Junior Achievement of Santa Clara County
and the Institute for the Future
(March 2001)

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1. Introduction

This report summarizes the findings of a research project conducted by the Department of Anthropology at San Jose State University, Junior Achievement of Santa Clara County and the Institute for the Future. The goal of the project was to understand how middle school or high school students are engaging information technology in their daily lives, and how those patterns of use are related to how best to prepare people for careers in the region. The research project was exploratory in that it was designed to elicit potential questions for further investigation, not to provide definitive answers to complex and emerging questions.

The project was conducted as a partnership among organizations with different but complementary missions. The Department of Anthropology at San Jose State University is committed to providing students with practically-oriented, real world experiences to develop their research skills, while simultaneously providing service to the communities of Silicon Valley. Junior Achievement brought access to students and a concern for issues of workforce preparedness. It was especially interested in research that could provide a broader context for the latter issues. Institute for the Future brought years of expertise with technological change and the use of information technology by youth.

The research on which this report is based is informed by the ethnographic methods of cultural anthropology, which may be unfamiliar to readers used to survey findings expressed in statistics. The latter are necessary to establish the extent of a phenomenon, but they typically reveal little about how a phenomenon is manifested in the lives of people and what it means to them. For example, a survey can determine how many students work at least 12 hours a week, but it will not reveal how those twelve hours play out over a week, how they affect other activities, or what they mean to the student. Interviews comprised of open-ended or "semi structured" questions intended to elicit a student's perspective on the issue can capture provide a richer description of the issues. Such research complements, but does replace, the familiar survey data and statistics. The goal of such an ethnographically informed approach is not mere description, but an analysis that gets at assumptions, values, practices and more refined questions about the issues.

This report first describes the project methodology of "semi structured" interviewing in three local schools. It then summarizes the findings from those interviews as they pertain to several familiar domains of everyday life, such as family, work and education. The report next explores some recurring themes that cut across the different domains, and finally, the implications of the research are presented.

2. Methods

The research team met in September with Andrea Saveri of the Institute for the Future to brainstorm research questions about student technology use and workforce preparedness. The team discussed possible questions for inclusion in the interview instrument, which was ultimately the responsibility of the author.

Simultaneously, Darrah met with Elaine Curran and Debbie Gale of Junior Achievement to discuss the proposed project. Ultimately, Junior Achievement arranged for three teachers to participate in the project.

One site was a high school west of Bayshore Freeway in the San Jose-Santa Clara area and participating students were drawn from two senior classes. Twelve students from this school were interviewed. The second site was a high school east of Bayshore Freeway in the central-southern area of San Jose. Again, students were solicited from two senior courses, and five students were interviewed. The third site was a class at a San Jose middle school east of Freeway 680. Five students were interviewed. Darrah made presentations describing the project to the high school students, and the middle school teacher made the presentation to his class. Students were given consent forms (Attachment 1) that had to be signed by a parent or guardian prior to being interviewed. Ultimately, interviews were conducted with 22 students. Due to promises of confidentiality the names of the schools and teachers cannot be revealed in this report. However, the project would have not been completed without their assistance and they deserve the gratitude of each partner to this research.

In addition, the interview instrument was converted into a written survey that was completed by students who were not interviewed due to limits on the research team's resources. Thirty-six students at the first site completed this survey, as did 17 at the middle school. Although the surveys did not provide the depth of response as the interviews, they serve to complement the latter.

Students were interviewed twice by the same member of the research team to provide continuity. The interviews were usually separated by at least a few days, and sometimes by as much as two weeks. All interviews were tape recorded and then transcribed by the interviewer. Interview questions were designed to elicit stories, descriptions and interpretations by the students. They typically served as triggers to a dialogue with the interviewee about a subject. The weakness of this approach is that each response unfolds as a unique event, making comparisons between interviewees challenging. The strength of the approach lies in its capacity to capture the nuances of the student's experiences as the interview unfolds.

3. Patterns in Everyday Life
3.1. The Diversity of Lives

The interviews reveal the striking differences in the daily lives and life circumstances of the students. By everyday life, we mean the activities, relationships, locations, and rhythms that define daily life from the perspectives of those who live it. Predictability and regularity mark the everyday lives of some students, especially those in middle school. They get up, go to school, and return home to complete homework. Alternatively, they participate in extracurricular and recreational activities with friends or family members. Some students return to homes where a parent is always present, and the main contrast in their lives is between weekdays and weekends. For other students, their daily lives are fairly regular, but they simply pack more activities into each day, including clubs, church activities, additional classes, etc. Their lives reflect the tight deadlines and lack of slack that characterize the lives of many adults, including their own parents. The everyday lives of many other students varies considerably day by day, so that Tuesday might be radically different than Friday or Sunday. Their lives are improvisations in which school is only a small part. For some, it is easy to forget that they are high school students

The following summaries of typical weeks illustrate the variety of schedules and circumstances. Names (and some details) have been changed throughout the report to protect confidentiality, but the stories provide accounts from the perspectives of the students.

Schedule #1: Susan. Susan described a world of predictable days, punctuated only by a job on Tuesdays and Thursdays. On Monday, Tuesday, Thursday and Friday her classes begin at 7:30 a.m.; on Wednesday they start over an hour later. Classes are over at about 2 p.m. and are followed by work at a large high technology company until 4:30 or 5 p.m. on Tuesdays and Thursdays. On Monday and Wednesday she goes home after school to do homework and prepare for the SATs. On Friday a movie with friends might be in the plans, and Saturday and Sunday mornings are taken with tennis lessons. The rest of the weekend might include shopping, seeing friends or joining in family activities.

Schedule #2: Van. Consider now the more complex schedule of Van. He arises Monday mornings at 6:30 a.m. and is at school by 7:30. His classes are over at 1 p.m., but he spends another hour doing homework while he waits for his friends to get out of class. Alternatively, he goes home to check his email. When his friends are out of class, Van chauffeurs them to a fast food restaurant for a meal and then transports them to their individual homes over the next hour. Then he races to the martial arts *dojo* where he works as an instructor from 3-9:30 p.m. He returns home to eat a solitary meal and then goes to bed between 11 p.m. and midnight.

Tuesday is similar, except he goes home to update his web page after delivering his friends to their homes. From 5-8 p.m. he goes to the *dojo* to practice karate and then comes home to eat, watch a movie video with his brother, and go to bed.

On Wednesdays he drives his friends to a movie complex to sit and talk, but not to view a movie; he has no time for that, he explains. After dropping his friends at their homes he is home by 4 p.m. to check email, and then at 6 p.m. he goes to the *dojo* for a class in a different martial art. He is home after 8 p.m., where he dines alone, watches television, and then falls asleep listening to music

Thursdays differ in that he has no activities scheduled in the afternoon and so can visit with friends or see a movie. He and his friends eat at a restaurant and he is usually home by 10 p.m. After reading email, he spends some time reading a book and is usually asleep by 11 p.m. or midnight.

On Fridays he again provides transportation for his friends after school and then goes to work at the *dojo* at 3:30 p.m. He is done by 7:30 and either sees friends, goes to a school activity, or returns home and goes to sleep.

Van leaves the house at 8:30 on Saturday morning and is at the *dojo* by 9 o'clock. He teaches classes until 11 a.m. and then remains to train for another three hours. Then he goes home to check email and have dinner with his family. Often he goes out to a movie with friends, but he is usually so tired that he is in bed by 11 p.m. He sleeps in on Sunday morning and then watches cartoons for a while. Later in the morning Van begins his work on the computer. Sometimes he is word processing assignments for school or making fliers for the martial arts studio. He works on his web page, constantly trying to improve it, and he plays online games with friends. Sunday is "family day," the only day he really sees his parents more than in passing, and the family dines on the special dinner prepared by Van's mother.

Schedule #3: John. The parents of John, a high school senior, live in the Central Valley and commute daily to San Jose. During the week, John lives with his grandmother in San Jose and attends school in the region. Sometimes the vagaries of transportation require him to commute with his parents, so he arises for school at 2:30 a.m. and prepares for the long commute. John comments, "I was up at two-thirty coming this way. I got here at four. Took a little nap. Got dressed at five-thirty. Went and got some breakfast and got here at seven. And I gotta work after this."

John has a car to get from place to place, but if it breaks down he is on his own, "'cause my parents are always at work or sleeping or something." His backup is a bicycle that he can ride to school and work. When asked how his parents or grandmother know where he is at, John replies, "They don't. They can't get hold of me at all. They hate it. Like I'm either at school, work, and then afterwards I go home and sleep. I don't have time. I start work at one o'clock [1 p.m.] and I don't get off 'til ten [10 p.m.]. And after that I go home, sleep, and I wake up at six [6 a.m.] and do it all over again."

John reflects on his life: "I feel all old, I walk in at night. I feel all old and everything. One day I was a little kid. Now I feel old [laughs]."

There are several important implications of these tales. An obvious one is that there is no typical or normal pattern of everyday life for students and they routinely encounter other students living dramatically different lives. The variations in everyday life are built around different school schedules, family/living circumstances, the logistics of maintaining ties with friends, work obligations and a myriad of extra-curricular activities. Some students, especially the younger ones, are appropriately called students in the sense that their lives revolve around school. For others, school constitutes only a minor part of their lives and imposes only some of the constraints which they encounter daily. They may be students from the perspective of the educational system, but to do so captures only part of their lives. All are comparing themselves to other students whose lives may be comprised of vastly different combinations of activities, people and relationships, obligations, and movements. Furthermore, they may be aware that these combinations are associated with probabilities for different future outcomes. John, for example, would like to get a college degree and work in the computer industry, because "that's where the money is," but realistically, "I see myself working at the same job I am now. Probably a higher level up. Probably a salesman. There's money in that."

3.2. Family

Differences in everyday lives reflect differences in families and living situations, which varied from nuclear families to more complex arrangements involving extended family members, fictive kin and borders. The students' lives are typically grounded in the realities of family and meeting the expectations of parents, although family form varied greatly as did the expectations. When the students talk about their own lives ten years from now they typically talked about being married, having children of their own, and owning a house. Thus, family is clearly important, and the students probably overstated their own separation from their families. Indeed, they are teenagers living in America, and this pattern is an old and familiar one.

It is not always clear in the interviews, however, who is home and what family means to the students, In the majority of interviews the students portrayed themselves as independent agents who were responsible for making sure they met their daily obligations. For example, one boy commented that he rarely saw his parents: "To be honest, I only see them an hour a night and an hour in the morning and on the weekend. Actually, on Sunday." This sentiment was far from unusual. Family life is often subject to the same scheduling pressures as the rest of the day. For example, Angie, a senior, says she lives with her father, a younger and an older sister, and a younger brother. Her parents do not live together and finding time with her mother can be a daunting task.

> My mom and dad aren't together so she doesn't live with us. I go visit my mom sometimes but not that much. I just stay with my dad. I don't get to see my mom that much, 'cause like my schedule is so crazy that I don't get to. With school and work my schedule is so compact, I mean it's so crazy that my mom, you know, has to come to my work just so we can talk and stuff My schedules are weird, like so if she doesn't come visit me on Tuesdays when I have nothing to do then she can come pick me up from work and we can talk, but she's so busy and all during the week.

Angie's interviewer asked if she felt that she had to make an appointment to see her mother: "No, well I don't like to think of it that way. When I have time I see my mom and even if it means spending the night at her house."

3.3. Work

Work is significant in the lives of these students in several different ways. The work of their parents is clearly a significant element of their own lives. The most frequent answer to what parents say about their own work was (1) work is hard and (2) they are tired. Few students claimed to know much about their parents' jobs, but they *did* understand the message that work is hard and necessary, and that more education will allow for careers that provide more money and more discretion in the use of time. The fact that parents were typically gone and often unavailable during the day further amplifies the students' awareness of the reality of jobs and careers.

In addition to parents' jobs, most of the high school students held jobs, some of which entailed significant responsibilities or commitments of time. It was not unusual for a student to work until 8-10 p.m. several days of the week, as we saw above in the stories of Van and John. Indeed, the interviewers often commented that they felt they were interviewing workers who went to school, and not students who also worked. These students are not simply preparing for the school to work transition, but they have largely made it. The jobs they hold range greatly in responsibilities and skills, as well as their connection to subsequent career plans. But a significant number of them understand work from direct experience, and others encounter it vicariously in conversations with their friends.

The need for and use of money earned through work is not clear, but some students were generally aware of the high regional cost of living and it was already affecting career plans. One senior commented, "I actually want to do something with art or music. I love art. But to live in San Jose, that's gonna be really hard 'cause San Jose is so expensive. No one can afford anything anymore, everything is so expensive. I might have to incorporate the computers with the art, somehow. Probably computer animation." Thus, the cost of living can exert its effects on career choices long before college.

The rationale for work is difficult to assess. In some cases the work provided pleasure (and income), as in the case of Van, the marital arts instructor. In other cases the job funded purchases of the luxuries of teenage life, such as entertainment and a wide array of technological devices. In still others the job helped support the student, perhaps contributed to family income or future college plans. In general, the interviewers were struck by the abundance of consumer electronics devices, the ubiquity of paid employment, and talk about the cost of living. The role of student employment in meeting basic household needs, other consumer purchases and in funding educational plans warrants more attention than was possible in this project.

The students have explicit ideas about good and bad jobs, although the details of each are fuzzy. When students talk about good jobs several characteristics recur. One common sentiment is that you should like your job, and in turn, any job you like is a good one. The ability to help people is widely noted, as is compensation. A job with "security" is desired, with security including employer training that indicates commitment to the employee. Good jobs also have status or prestige, and they generally involve the use of technology, typically computers. "Use" is poorly defined and the students did not consistently differentiate between (1) a job in which some sort of technology is used, (2) one in which technology is developed or produced, and (3) one in an industry defined as "high tech."

When the students talk about bad jobs they emphasize doing things that hurt other people (e.g. dealing drugs or other crime) or that are immoral or self-destructive, such as prostitution. Jobs that generally lacked respectability or status in the community were widely mentioned. Other students talked about inadequate pay, poor or absent benefits, and lack of training opportunities that prepare the way for future career moves. Specific "bad jobs" mentioned were cashier, fast food restaurant worker, and garbage man. Other jobs, such as teacher, elicited ambivalence, since they both allow the person to do good, but they pay too little.

Ideas about good and bad jobs, grades, and future lives are intertwined and not expressed separately. Consider the following comments from a girl who is a high school senior. "My mom's boyfriend, he's her fiancée, he says 'Ds are for Denny's.' If I get a D on my report card, [he says] I'm going to work at Denny's my whole life, whatever (laughs). They say you have to get a good education so you can get a good job and my mom wants me to go into Cisco or something like that because that's where all the money is." She continues, musing about her optimistic future: "I want to be a cosmetologist, so I would probably doing all that stuff. the hair, the make-up, the skin, the nails, all that stuff. And I'd probably be doing it somewhere [where] you'd get paid a lot, at a nice place. And then I'd probably have a family and a house and everything like that." Here the admonition to succeed in school is backed by the threat of fast food work, while Cisco is presented as an undifferentiated reservoir of money. The girl remains uninterested in the plans being made for her by others, instead preferring a career in cosmetology.

Attitudes about careers and their relationships to computers may well reflect parental jobs and how parents talk about their jobs at home. A parent may engage computers in specific ways, ranging from conducting basic research to data entry, that are reflected in negative or positive statements about their jobs, and by extension, the technology they use. Accordingly, students do not learn lessons from the technology in isolation, but from its uses by people who tell stories about it.

The students (and their parents) generally linked learning with better jobs. They spoke of admonitions by their parents to do well in school and avoid trouble there. Few parents seemed indifferent to school success. However, few of the students talked about receiving extensive, specific advice by parents about how to plan for a specific career. This gap may well be an artifact of the questions asked or a tendency by teens to ignore parental advice, but it may also reflect a deeper pattern of parental overwork. Specifically, many of the parents reportedly worked long hours and perhaps have little time for providing their children with educational or career advice.

Some students of professional parents seemed to have an almost intuitive understanding of the necessity for higher education and the steps required to get it. Their knowledge seemed obtained less from specific conversations with parents than by an osmosis-like process of growing up in households where professional careers and educational achievement are assumed. From this perspective, reliance by students on specific career advice by parents and militant admonitions to do well and avoid trouble may reflect the lack of opportunities for students and their parents to engage more deeply in discussions of job preparation. The latter is left to the schools, and the admonitions serve to comfort the parent that they have fulfilled an important responsibility to the child.

3.4. Technology

The interviewers asked the students to describe the technological devices to which they had access, and the lists were generally extensive. Students households were typically equipped with multiple televisions and video cassette recorders, CD and DVD players, home computers, PDAs, pagers and cell phones. Ownership of these devices was sometimes unclear, but access to technology was ubiquitous. What was not accessible at home was usually accessible at a friend's house or a public library. The result is a sort of technological "saturation" in which the technology has become so commonplace as to be invisible, and the incorporation of these devices into daily life is simply accepted.

The following excerpts of technological inventories convey a sense of the amount of devices.

• An interviewer asked a student if his family had a computer at home: "No. We've got four. One of them is a laptop. Actually we have five. One's a laptop. One's on my brother's side. One's my mom's and then I have two and there's more at my dad's store." This boy's mother works in computer aided drafting (although he was not sure of her job) and his father sells jewelry.

• Another student recounted, "We have three televisions in the house and we have satellite TV on the one that is upstairs. My dad, he has his business and he is the president of his company and he bought another house in the area and that is where he keeps all of his computers. Basically, my dad bought the house that was for sale across the street. I think we have 44 computers in there. Yeah, my dad has a ton of stuff there—fax machines copier, you name it. It's pretty neat."

• One student was alarmed when he forgot a cache of cell phones: "That's one thing I forgot! We've got cell phones galore at my house. My cousins come over and like forget their cell phones. We've got like five or six cell phones just laying around." He gestures as if holding a phone and making a call: "Who's this? I don't know. Hold on. Let me make a quick call. Hello?"

The web of devices provides the infrastructure through which the experiences of many students are mediated. For example, one boy described his use of the Internet: "I go to game sites, I download a lot of software and stuff like that on it, and I'm into building web sites. I spend a lot of time doing that too. Trying to find topics on how to make my site better. I don't go into chat rooms, but I use AOL Instant Messenger." His Internet use drives his desire for additional technology: "I'd like to have DSL or cable. Or a cell phone, maybe a Palm Pilot, too. When I do web sites and I want to upload stuff it's real slow with a 56K modem and when I download it's real slow, too."

The technological inventories shift over time, but the process is generally an additive one: Devices are added and updated, but seldom deleted. Indeed, the students were unable to identify devices they would get rid of, except to buy a newer model or newer technology that would substitute for the older one. The devices actually used reflect the varied characteristics of the students' networks. In some cases, parents require access to their children under some circumstances, such as when they are "out" with friends. Such access takes specific forms, such as through cell phone or pager, or through a friend with the appropriate device. The student's social network also plays a role, as when they "all" have access to pagers. For many students, the issue is not what devices they own, but which they have access to, either from their family's collective carton of cell phones and pagers, through the devices on their friends person or at their friends houses, or via public arenas such as schools and libraries. A consequence of this technological saturation is that the students do not seem to be choosing whether to have a cell phone or pager, but rather which model to use.

Technological devices cannot be fruitfully considered in isolation of the social uses to which they are put, and they are indeed the focus of many social relationships. In some cases the social significance of the technology is plainly evident, as in the case of a boy who said the rule regarding his technology is, "Stay outta my room. Don't touch my stereo, my DVD player, my TV, or my CDs." This admonition is directed primarily to his younger sister, but to other members of the family as well. Here technology is the property that comes to define relations with other family members. In other cases, the efforts of the student to convince their parents to purchase additional technology becomes the primary arena for family negotiations. One boy described how his friends tried to influence parental decision-making:

> Well, most of my friends are seniors right now so they want to get a car. If they have a car they want to get a better one. And their parents don't want to pay for it. They think they should get a job. Then the faster Internet service in another thing. Most of my friends have it, but some of the parents don't think it's that important. They think, "You already have Internet service, why do you want faster? What is the need for that?" And cell phones, too. Anything that is portable, like the Palm Pilot is another thing. Some of my friends have cell phones and some of them have Palm Pilots, but some other ones, don't have it. They can't seem to convince their parents to get it.

On one level, a student's argument might simply be to acquire more cool stuff and thus conform to (or exceed) the expectations of his or her friends. This, of course, is familiar terrain in the relationships between parents and teenagers. What is distinct, however, is a rationale that links purchases of prestige goods with preparation for education, work and life. There is the implication that these are the artifacts of the world in which the students' life will be lived and mastery of them is just another addition to the skill set. In this way, the negotiations can be simultaneously pragmatic ("I need it to keep in touch"), crass ("I need it because it's cool and everyone will be jealous"), and moral ("It will prepare me for life").

Technology can be both an instrument of control in a student's life, as when he or she must agree to be "accessible" if out with friends, as well as one through which responsibilities are exercised. For example, one student described how she served as a parent to younger siblings to regulate their Internet access:

> Well, like I set up everything on the computer so like when my brother and sisters use the computer they need to ask for my help 'cause like I put a restriction on what stuff they can look at. I put them

under young teens instead of kids, which is what they are supposed to be under, so like when he wants to look at certain stuff he needs a general (i.e. a code that allows the user to explore any part of the Web). Here the student stands in for a harried single parent who fails to control the access of his children to the Internet.

The significance of technology access can be complex and even contradictory in students' lives. For example, a cell phone might reflect dependence if it is there so the parent can reach the child or vice versa, but it might be a symbol of freedom, too, as when the child can arrange activities with friends. Alternatively, an automobile can represent both independence and the obligation to transport friends or younger siblings.

Finally, it is striking that technology is the focus of considerable learning and teaching by the students. Several commented that they provide instruction to their parents or siblings, while others received instruction from parents, family friends, at school or in the workplace. Much of this instruction and learning is informal and based on trial and error. Much of it is self- instruction, too. One boy commented, "I learned by myself Just trial and error. Just do something. If it didn't work, I try again, try again until I learned how to use it." He also teaches others in his family: "My sister and some other people. Like even though my dad has a degree in computer science, he still needs my help." Self-instruction and more formal instruction often intersect in the workplaces where many students spend hours each week. One girl remarked that first she learned about using computers on her own, and then that was supplemented by learning at her job as an "admin" in a local company: "First, I taught myself, but then when I went to work . . . 'Cause I work at the office and they teach me how to use all these programs I didn't know how to use."

Technology use is deeply embedded in the lives of these students, just as it is embedded in a complex array of social relationships and values. It provides the medium through which issues of personal identity and efficacy are explored, as well as interactions with other people. It both provides the means for being "in touch" and it draws students into ongoing negotiations with parents and the work world in order to capitalize their technological infrastructure.

4. Themes
4.1. Independence

Not surprisingly, independence, autonomy, and responsibility are recurring values expressed in the interviews. These values are typically directed toward parents, and the tension between parents and their teenage children is a familiar one. We have seen that these values are also implicated in the use of technology, ranging from automobiles to personal computers. Devices do not simply resolve tensions by providing the means for autonomy, but rather they transform it in complex ways. The pager and cell phone may permit forays into a larger world, but they also provide tethers of parental control that remind the student that autonomy occurs within constraints. One 18-year-old male commented about his parents, "They know where I'm at. If they want to check me they usually call the place where I'm at work. They know that I'm there. They hardly do that." If his parents need to reach him they do so via his pager. If he needs to reach them in an emergency, both his father and brother have pagers and cell phones, and his mother "is always at home."

Even the automobile, the enduring American symbol of freedom, has this ambivalent quality. It permits movement without the need to bargain for parental support, but it is often accompanied by increased responsibilities to chauffeur others around or the knowledge that ownership is connected to the exigencies of work.

Cutting across all discussions of autonomy, independence and responsibility is trust. The latter word is ubiquitous in the students' discussions of their everyday lives and their use of technology. One boy commented, "Well, they trust me. It's, I tell them where I am going and they trust me. It's all based on trust. They know I don't smoke, even though my friends do, and stuff so even though I am going out with them they trust me to make the right decisions so I tell them where I'm going." Trust is earned, not taken for granted, and once established it provides the metaphorical "hall pass" that both facilitates movements without parental involvement

and minimizes the requirements for reporting about the student's activities or locations. It also facilitates use of the devices that connect the student to friends, provides much entertainment, and is necessary for completing school assignments.

Trust is also associated with rules and the latter are routinely broken, according to the students. A middle school girl remarked, "Sometimes they (i.e. her parents) go, 'You can't go online because school is more important' and stuff like that." When asked if she ever breaks the rules, she replied, "I don't know. I always break the rules. My dad goes, 'You have to get off the Internet,' and so I have to listen to him. But I break them all the time."

One senior described the difficulties he confronts when he has work to do, but is being punished for violating a family rule about using technology. When this occurs, "usually they say I can't use the computer and on the weekend I have to go to the library to use the computer and spend a couple of hours just to work. Or I can use the computers at school. So I just get around it." He elaborates, "The library or school, or I go to my friends' and study. Like my friend's house, I can go there and use his computer. I can do my work there. And they usually call and make sure I'm doing my work and stuff there." He would like to augment his current technology inventory: "I would like to have a Palm Pilot so I could bring it to school and do work and after that I could bring it home and plug it in to my computer and keep working."

Another boy discussed a widespread sentiment, the frustration of constant parental admonitions to follow the rules. He recounted a tale that captures the frustration he and his friends as they encounter the rules.

Actually, most of them have this problem about how their parents always say they're (i.e. their children) not listening to their parents. And they're not doing exactly what their parents asked or told them to do, such as going out to parties late at night or hanging out with friends. Parents says every time, "Don't do this and don't do that." They have to [say] it every time. The kids kind of get tired of it. This one time, this friend of mine, I guess he just listened too many times, and [his] parents were still yelling at him. He just went out and did the exact opposite of what the parents say. 'Cause he had never done it [before]. He's 17, 18 right now. And every time he goes out his parents always say, "Don't do this and don't do that." He just got tired of that, so he just went out. He only did that once. He scared the parents and I think that's it. He only did that to scare his parents, just to prove that we really don't need to talk about it so many times. Because the parents always see what's going out there, not actually focusing on their own kids: how they do in school, how they behave. The parents are always comparing between the world where there's a lot of bad people, or 1 say bad people compared to their kids. That's how they always get that impression where, you know, every time you go out you're going to do something bad.

Breaking rules, however, is not merely an act of rebellion and can instead assert larger moral claims. For example, one boy who carries an illegal pager to school does so because he expects to receive phone calls from co-workers who need him to substitute for them. Here a local rule is broken in order to demonstrate greater responsibility and maturity.

Autonomy, independence and responsibility are not merely values, but they *characterize* the lives of many of the students. From this perspective, these three values merely celebrate and acknowledge what is real and unavoidable in families where parents and children have busy schedules. The students achieve a sort of autonomy or independence because of their parents' work schedules and other commitments, and the obligations of other family members. While some logistics can be handled through planning, it may be difficult for parents and to accommodate to changes in the schedules of the others. In such circumstances logistics becomes an improvisation that demonstrates the student's responsibility and ingenuity. In some situations, the student also demonstrates responsibility by assuming parts of the parental role vis-à-vis other siblings. In some contexts then parental "trust" might not be based on an assessment of whether the student earned it, but rather on a more general assessment of parental control under different conditions. For example, a parent who is too tired

or busy to spend time using the Internet with their child may see the choices as (1) prohibiting the child's usage or (2) allowing it as evidence of "trust." In this way the uncomfortable comprise becomes transformed into a virtue.

4.2. Being Busy, Being Connected

Being busy is a fact of life for most of the students and, apparently, their parents. Students participated in a wide variety of activities and "being accessible" to family and friends is important. "Busy-ness" is ubiquitous and seemingly reflects assumptions that being occupied with planned activities is preferable to unscheduled time. The students we interviewed study at school and home, they work, participate in clubs, lessons, and sports, and they "hang" or "chill" with their friends. Indeed, "chilling" for even brief interludes is widely cited as relief from the pressure to succeed academically, be involved in activities that will pay off in the future, or go to work. One Asian boy complained, "Our parents expect us to study too much after school and there is not much time to do anything else besides study because of this expectation." When asked to speculate about his parents' concerns he replies, "It's getting into a good school, like a good business school and stuff. Like 1 want to get into the UC system." Although he said he works hard, he feels that he is victim of stereotypes about Asian students: "All my friends are Asian and usually non-Asians, or at least white people, think that we're really smart. But, like me, I'm not like a straight A type people. I'm an average student, a C guy. But people think if you're Asian that you're supposed to be smart, but I'm like, 'No, I'm not smart. I'm an average guy.'"

This busy-ness of children is at least partially a function of adult lives. One boy who was tightly scheduled in school and clubs explained that he spends limited time on the weekend with his parents. "My mom is the founder of a [name of a country] school and she works on Sunday mostly. All Sunday. So, she's the founder and also the vice president, and she keeps on teaching, keeping our culture going." His father is either attending religious instruction on Saturday or working. The student adds that his mother generally is at the school on Saturdays and his father usually returns to work on Sundays since his wife is at the school. The boy drives his sister to Girl Scouts and then continues on to his own Boy Scout meeting. He is not openly resentful of this hectic schedule and in fact states that he wants to make as much money as possible so he can buy a permanent facility for his mother's school. Nonetheless, his own schedule reflects the tightly scheduled lives of his parents.

4.3. Selectivity

A final theme incorporates selective attention and strategic ignorance. The lives that many of the students are filled with an almost overwhelming buzz of relationships, activities, information and things. The very richness of this environment necessitates selection among competing claims for attention. For example, being in touch does not mean being in touch with *everyone* all the time. Thus, the students make decisions about what to attend to and what to ignore. They are selective in the technological devices they use. They accept using them in principle, but no one uses them all. They are selective in their friendships so that they have networks that they manage to merge or keep discrete. Some students are widely connected and others prefer to restrict their relationships. Like adults, they make decisions about where to invest their limited attention and time.

Selective attention can reveal the complexity of a student's abilities and limitations. One girl described her technology use as follows: "I know with a cell phone I'm only gonna use it to call my dad and stuff, and like all my friends, I mean I'm not gonna give them the number because I don't want them calling me 'cause they've got my pager number. If I feel like calling them back that's good enough. I mean, I wouldn't give out my cell number to everyone. I mean only my family would have it and stuff." On the other hand "half the school" has her pager number. How, the interviewer asked, does she know who is paging her since her number is so widely distributed? "Well, like either I know their house number or whatever number they're calling from and most of the time my friends have pager codes so like they'll be like '25' and I'll be like, 'OK, that's my friend Patricia.'" When asked how she knows where to call, she replied, "Well, like my friend will put 'call me 25' on my pager and then I know to call her back at home, but it gets confusing 'cause like my other friend has a cell phone,

pager and a home number. So when he puts 'call me 14,' I'm like, 'Where?' Oh dang! So I'll just call his cell phone 'cause I know he has his cell phone on all the time." She is able to keep track of the numbers and codes, she says, because "I have a good short term memory, so I can memorize their numbers really easy." This student is going to night school to retake a class she failed and she has only nebulous career plans. Ironically, while she failed to pay sufficient attention in at least one class, she is able to focus considerable cognitive skills on her networking.

5. Implications and Questions

This project is best viewed as exploratory research in which firm conclusions should be eschewed. Instead, the goal is to suggest some implications that might be salient to both Junior Achievement and the Institute for the Future. Such research often tells us more about what we do not know, than does it establish a factual base upon which to draw strong conclusions. Accordingly, some questions for further research are also developed.

1. The students live in a world of heterogeneous everyday lives. Some of these lives are fairly routinized (especially for the middle school students), but others rival those of adults in their complexity. Most students are very busy, as are their parents, at least by the students' reports. These conditions may make it difficult for parents and their children to engage in spontaneous discussions about education, work and careers. Households undoubtedly differ as environments in which information about successful careers is available from observation or discussion, and some students seem to understand at least the broad outlines of how to prepare for a well-paying and satisfying career. They may achieve this understanding through years of watching and listening to their parents' conversations. In other households, career relevant information might be in scant supply because of the parents' jobs or daily schedules that just do not allow family members to spend much time together.

> **Implications:** A variety of programmatic approaches that assume diversity in fundamental assumptions about work and education are implied. Finding alternatives to parental conversations about work and education as ways to transmit relevant information might be useful.

2. The lives of many students are saturated with the effects of work, whether their own or their parents. Parents' work schedules are often intensive and they were tired when they return home, thus reducing the time for casual discussion. Most students expressed ignorance of important facets of their parents' jobs, and their knowledge of many jobs was sketchy at best. Often their knowledge of career preparation could be reduced to the admonition to go to college. Yet most were also keenly aware of the ultimate importance of work as a means to provide a good life. In fact, many sounded tired of the encouragement to work hard, go to college, and think about the future. Thus, a student could both lack specific career related information, while he or she was simultaneously overwhelmed by the magnitude of work in the present and future lives. Much of what we heard from the students can be interpreted as resistance to this imposition of work, or more generally, to living in a region where life is an extended internship in preparation for work life.

> **Implications:** Students' knowledge about work and its effects on lives is extensive, but it is also very uneven. Most understand the brute fact that they must work and to do so will profoundly shape their lives, but they understand much less about the characteristics of specific careers, much less jobs. While providing the skills and knowledge that are bases for educational and work careers is important, there is also a danger of turning off students who are already overwhelmed by the effects of work in their own lives and the ubiquitous (if inadequate) messages they receive about preparing for the future.

3. The students can be both technologically savvy and ignorant. They are extensive consumers of a wide array of devices, either directly or through their parents. Clearly, they are important drivers in decisions to purchase devices. They assemble the devices into often-transient networks, use them and then start over. Many spend significant amounts of time using devices such as computers and the Internet for educational, work and entertainment purposes. They are often quite innovative in their social uses of the devices, and their degree of comfort with them is likely far greater than that of their parents. Yet this savvy in use may not be accompanied by the skills and knowledge necessary to produce such devices. Put crudely, they might be sophisticated users, but they might also be failing the mathematics courses that are necessary to build the engineering career of which they dream. The saturation of devices and the very ease of their use might actually be deceptive in that they conceal the sheer work that is embodied in those devices, and the skills needed to develop them.

> **Implications:** Students have everyday lives in which technology is heavily embedded. Those lives can provide opportunities to develop curricula based in everyday problem solving that develops work related skills and knowledge. Leveraging those experiences can situate lessons in experiences the students believe are immediate and valid. Specifically, many students use technology in innovative ways and we may ask if those uses could provide the basis for curriculum. Alternatively, many students take for granted the work that is embodied in a device and they mistakenly assume that because they can use it they can produce it; thus, the vague talk about being a software engineer. Curriculum could also focus on making visible that hidden work.

4. Although this project is not directed at the set of issues that have come to be called the Digital Divide, it is certainly salient to it. If such a divide exists, it is not based exclusively on the presence or absence of digital devices. Most student families, regardless of estimated socioeconomic status, were well equipped with an array of devices. These devices themselves can be extremely sophisticated and powerful, but they can be used as an electronic "ball and chain." It cannot be assumed that use of a device is associated with higher skills or knowledge. Furthermore, the interviews suggest that the social networks and contexts within which students' lives their lives are critical to the lessons they learn about career preparation. Some networks seem associated with consumption of devices, while others are the means for creative productions of varying kinds. This social context is certainly more elusive than enumerating devices, but it is likely the domain in which successful futures are based.

> **Implications:** The Digital Divide may simply be a code or euphemism for a variety of issues relating to present or future socioeconomic differentiation and its connection to technology; it is not one thing. Access to technology is largely irrelevant, since we found students from a variety of households with comparable access to devices. The importance of social networks and access to particular kinds of information seems critical. Social skills in how to self-presentation may be necessary to complement technical skills (which are themselves diverse).