Involving Parents at Step One in the Freshman Engineering Experience

Dan D. Budny, Cheryl A. Paul, Beth B. Newborg
University of Pittsburgh, Pittsburgh, PA, USA, (budny@pitt.edu)

Abstract—**The transition from high school to college can be very difficult for many students. The authors believe that parents can advocate on behalf of their children by educating themselves on particular transitional challenges their children potentially face, as well as by helping these freshmen daughters and sons establish realistic educational and social goals. Parents can assist their children by helping them to anticipate the significant transitions that occur during the freshman year. This paper will acquaint the reader with three key transitional challenges new college students face, and offer an approach to productive interactions between the Swanson School's orientation facilitators/freshmen faculty and the parents to ease these challenges. The paper will demonstrate the importance of making parents part of the first year orientation and educational process. Steadily improving persistence rates at the University of Pittsburgh's Swanson School of Engineering indicate that educating new students and parents in realistically anticipating first year challenges allows first year to successfully work through key freshman year challenges.**

Index Terms—**Keywords-Freshman Year Experience, Parents, Transitions**

I. INTRODUCTION

Numerous studies document the importance of acquainting parents and family members, as well as the freshmen students themselves, with the new academic setting. Research indicates that when this kind of education in the challenges and processes of the freshman year is offered to the student and to his or her family members, a positive transition is much more likely for the student. [1 - 5]. Indeed, helping students and their families anticipate and understand the life changes of the first year can help the university realize a significantly higher first-year student persistence rate [6].

For many years, university programs have familiarized incoming freshmen with the basic processes and arrangements of academic life via pre-college orientation programs. Research into what contributes to best experiences during the freshman year, however, suggests that in addition to explaining the new policies and procedures to students, it is also important to significantly involve the first year student's parents in the orientation process. Successful first year advising and support programs should, therefore, make it a priority to involve parents in the orientation process. Both pre-college orientation and ongoing support programs should clearly and definitively:

1. Raise the knowledge-level of first-year undergraduate students and parents about the lifestyle changes that occur in when moving from home to a campus environment [7].
2. Ensure students' and parents' ongoing awareness of university services crucial to a productive adjustment process [8].
3. Through interactive discussions and through specific written materials, expand parents' and students' awareness of the significance of the challenges and changes students are facing and of successful strategies for meeting these challenges productively [9].
4. Help parents and students develop and maintain a positive attitude toward their first year at the university.

This paper will provide a brief overview of pertinent issues encountered by students and their families during the transition from high school to college. The paper will then depict concepts and activities used at the University of Pittsburgh's (Pitt's) Swanson School of Engineering during the initial student/parent education workshops to give students and their parents significant insight into and productive approaches to the challenges of the first academic year.

The primary objective of the workshop interactions is to establish a proactive, empathetic family interaction that is designed to ease transition stress and encourage first year student persistence. It should be noted since implementing the student/parent discussions in the freshman orientation workshops, Pitt's Swanson School has experienced a steady decline in first year engineering student attrition, from a high of nearly 30% in the late 1990's and early 2000s to the current rate of approximately 15% over the past 10 years. Many elements, such as changing student demographics, improved classroom facilities, creation of living learning communities, and improved teaching techniques can be factored into these improved retention figures; however, based on careful observations and extensive experience, the authors believe the concepts and activities described in this paper contribute significantly to Swanson School students' persistence through their first, intense, year of engineering education.

II. TRANSITIONS

"Dear Mom and Dad:

You know, the more I think about this college thing, the more I am starting to realize we are probably all in this together. It seems like you always have the right answers (even if I don't act like I think you do), but anytime the issue of college comes up you usually seem as puzzled and as confused as I am." - Student email to their parent.

Making transitions is an integral part of life. During the transition from high school to college, students often feel the loss of familiar habits and settings and despair over

relationships that are no longer what they were [10]. The first year college adjustment embodies both the difficulties of loss and the excitement of new opportunities [11]. The most significant changes come as are part of three major areas of transition:

- Academic Transitions
- Family Transitions
- Personal Transitions

Numerous previous studies indicate that a student's first semester success can lay the groundwork for engineering program completion and/or degree attainment [12 & 13]. Therefore, appropriate support systems must be activated during the very first interaction students and their families have with the university. Several positive outcomes have been realized when students and parents are provided with equal workshop (educational) time with the members of the university community (such as faculty and advisors) who will continue to work with first year students. Studies show that students developing more realistic expectations for their upcoming year that translates into lower frustration levels for ideals unrealized [14], participating in educational exchanges increase student/parent perceptions as relative equals by the university, and are therefore more likely to become engaged in ongoing open communications [15], early awareness of campus resources strengthens and developing a students' potential to persist through a four year college program [16].

Given the outcomes listed above, it can be hypothesized that an educational program that attends to the needs of both students and parents will assist in creating a more successful academic transition experience for both groups.

III. PROGRAM IMPLEMENTATION: EDUCATING PARENTS

The best way to promote student retention is to begin the first year with educational programs, for both the students and parents, providing realistic advice on how to cope with typical challenges. At the University of Pittsburgh's Swanson School of Engineering, student/parent programs are designed to provide strategies and messages that will resonate throughout the first year. Although the delivery of the basic concepts has varied from year to year, the framework has always been a candid, highly personal discussion within faculty/parent, student/student and student/faculty groups. Separating the students from their parents is recognized as the best environment in which to address key issues, concerns, and possibilities, because it encourages new interactions that are free of guilt, resentment, and anxiety. Moreover, since particular Swanson School orientation activities impose separate discussions, participants are free of the conflict independence that can potentially distort participant perceptions and limit productive workshop dialogue [21]. Swanson School freshmen advisors and faculty have realized that having a separate discussion with parents about the key transitional issues also discussed with students is more beneficial than redundant. This realization is supported by numerous research studies citing the relevance of mutual reciprocity as important transitional variable [22]. Additionally, the list "Top 50 Pitt Parent Tips" is given to each parent. Handouts such as this inject humor into an otherwise serious discussion.

During the student/faculty and parent/faculty dialogues, the first message both groups receive is that the entire family is experiencing the changes, excitement, and sadness of the transition into the freshman year [23]. Students must understand that they can rely on their family for stability, but they must also give their family freedom. By acknowledging that everyone will now be engaging in the challenges that come with major changes, stressful family quarrels over both parties' newfound freedoms can be avoided, and a mutual respect for meeting those challenges is instilled [24]. The goal of the faculty/parent, student/student and student/faculty discussions is to get parents and students on the same page, working for the same outcome.

An important auxiliary discussion item addressed with both populations is the Family Equal Rights and Protection Act of 1974 (FERPA). FERPA legislates that for all students over the age of eighteen the university cannot, by law, provide parents with information on a student's academic performance [25]. Because a student's' instructors and advisors cannot give out information to parents, students are advised to regularly keep their parents apprised of academic successes and failures, thus keeping the family unit involved. Doing so not only reinforces trust, it also avoids unpleasant end-of-semester surprises. The difficult part of the discussion with parents is to discourage them from forcing their son or daughter to sign the FERPA "rights wavier" that allows faculty and advisors to provide any information about the student that a parent asks for. In the parent workshops, we explain that it is difficult to get the students to tell us the truth if they fear their stories will go right back to their parents without the student himself or herself having a chance to be a part of the conversation.

IV. KEY CONCERNS/RESULTS

In addition to the key challenges students and families face within the three areas of Academic, Family, and Personal Transitions, a number of additional concerns also span these areas. To help students with these adjustments, we seek out assistance from the parents by providing a basic topic discussion during the summer faculty/parent meetings. During these meetings we discuss the following key topic areas with the parents via a give-and-take feedback presentation approach. We begin the discussion of each topic with a quick survey using "clicker" response questions built into the Power Point presentation. Then, at the end of each topic area, we do a post-survey to measure any change in the parents' perception of each topic area. The following is a discussion of each topic area.

A. Authority (Control to Freedom)

It takes very little time for a college freshman to understand and embrace his or her newfound freedom. For many students, it is the first time in their lives they encounter the challenge of prioritizing their activities. Table 1 shows the handout that lists some of areas and types of decisions they will make, including decisions about clothes; classes; dating; drinking; drugs; eating; money; sleep/wake up times; religion; and communication with parents, roommates and friends. Unfortunately, a first-year student may begin exercising his freedom at the expense of academic performance, and provide a parent with countless worried moments.

TABLE I.
AREAS OF AUTHORITY

Changes from Control to Freedom Students can do whatever they want	

•Clothes
•Classes
•Sleep/Wake Up
•Dating
•Drinking
•Eating
	•Drugs
	•Money
	•Religion
	•Communication
	  –Parents
	  –Roommates
	  –Friends

Although the authority issue subject can be a sensitive to address with parents, we have found statistics and facts can productively drive the discussion The parents of incoming freshmen decidedly have a difficult concept to embrace: allowing their son or daughter to make their own decisions, which will include making a few mistakes along the way. This approach is especially important because it begins changing the attachment bonds between children and parents, and moves the relationship into the direction of separation-individuation, an important element of psychosocial maturity [26].

We try to explain, during the parent workshops, that the best way for parents to avoid surprises is to keep a line of communication open at all times, but to be careful of their reactions and responses when communicating. For example, if every time a student tells her parent something she is going to do, and the parent says "NO," or "do NOT do that," it is not going to take long for that student to figure out that she actually can do many things her parents don't want her to do; she just has to avoid telling her parents what she is doing. Therefore, instead of saying an immediate "NO," or "you should NOT have done THAT," parents are advised to use words like "no kidding," "that's interesting," "well it would not be my first choice," or, if the parent wants feedback, "let me know how it turns out."

As a further example of our discussion about communicating, we begin the parent "authority" session by asking the parents the following questions: [35]

- Who filled out the student's college application? [63% of the parents said the student filled out the form]

- Who asked all the questions during the college visits? [Typical answers are the parent asked the question 50% of the time, both parent and student about 36% and the student alone asked the questions only 13% of the time]

- Does your child do laundry at home? [Only 24% said their kids do the laundry by themselves, and 38% said the kids have never done the laundry]

- Does your child get up by himself or herself in the morning? [Only 59% of the parent said yes]

- How long has your child had an ATM card? [47% of the kids have experience with an ATM card].

What do these answers tell parents about their first-year students? The answers suggest to parents that there are a number of basic adult skills and responsibilities that their sons and daughters have yet to take on. The students should be taking on 100% of the skills and responsibilities related to these questions; they should and already be familiar with these kinds of activities and experiences. By pointing out "the obvious" to the parents, they begin to see that when the students are alone they will have to do their own work—whether it's preparing for an exam or washing their clothes or keeping track of their finances. The answers to these questions lead into the discussion of the students' ability to do basic life activities on their own.

Next we ask harder questions of the parents:

- How many of the parents got drunk or did drugs when they were 18? [Typically less than 2% answer yes]

- How many had sex before they were married? [Again less than 2% say yes].

- Then we reverse the questions and ask

- How many times has their son or daughter been drunk or done drugs? [59% say never or just once; 21% say they don't know or are afraid to ask]

- How many times has their kid had sex? [53% say never or just once, and 41% say they don't know or are afraid to ask].

These are difficult issues for parents to talk about, but they are real issues, and ones that significantly affect many first year students At this time we also discuss the FERPA requirements and how universities are not at liberty to discuss student-related issues with the parents. We emphasize that, as students are considered to be legally "adults" with an adults' rights to certain kinds of privacy, parents of these young adults do not have the right to university-related information about their sons or daughters. We have found that by discussing these topics with parents before the start of classes, parents have time to discuss these same topics with their children before such issues become problems in the freshmen year. After a 20 minute discussion of why it is so hard to talk to kids about the important issues in life, we again ask the parents for their answers to the questions about their own drinking and sexual history. The parents' "yes" answers to questions about their own experience with drinking and sex goes from 2% to over 85%. Once the parents make that leap to their truth, we ask the simple question: "If you did it why do you think your kid will not do it?"

The point for parents, then, is: tell your kids the truth! We stress that, while it is important for parents to tell their children they trust in their decisions, they must also make sure their children comprehend they must own the results of their actions. Thus, we ask the parents to have a conversation with their kids on freedom and consequences. We encourage parents to talk about the mistakes they made as 18 year olds and why they don't want their kids to make the same mistakes. But, we emphasize to parents, what is even more important is to explain to their children that they, the parents, understand why it can be so hard to make good choices. By the end of this part of the presentation 98% of the parents agree they must have a serious talk with their children about life lessons and choices.

B. Status (Top Dog to Rookie)

For many students, entering college means starting over in their academic classes, many times from the bottom up. When the reality hits that nearly all of their Swanson School peers were at the top of their respective graduating classes, it is not easy to accept a perceived lowering or, at best, equalizing of academic status. Many students find it difficult to make this adjustment. Table 2 is a copy of the handout that lists the status topics that we use in our discussions with parents and students.

TABLE II.
CONCERNS REGARDING STATUS

Changes from Top Dog to Rookie Students are Starting Over from the Bottom	
•Everyone is on top	•Class Size
•Not Important Anymore	•Homework
•Trouble in Classes	•Culture
•Workload	•Homesickness

To start the discussion in this area, we ask parents questions such as

- How many extra activities was your student involved in high School? [Only 2% say none]
- Would your student think s/he were important at school? [64% say yes].

Parents' answers to these questions provide a measure of the students' own perception of their status. With this understanding of how the student saw himself or herself in high school, the parent is better able to look for warning signs of difficulties that arise from a student's change in his or her accustomed "status." When parents hear their son or daughter talking about not being important anymore; about having trouble in classes; about the workload, class size, and amount of homework; about things being so different from home, and about homesickness, parents can recognize the signs that the student may be having trouble adjusting to all the changes that come with no longer being one of just a few "top status" students.

We then ask parents "what major changes have you had in your lives?" Most parents have a hard time trying to list anything, so we ask:

- Did you ever change jobs?
- Did you move for your job?
- Did you change majors in college?
- Did you get divorced?
- And the easy question: did your life change when you had kids?

Once the question is framed in these ways, 94% of the parents say, yes, they have had major changes in their lives. Basically we are trying to set a baseline with the parents, so they can measure the impact change has had on their lives. Once they recall the stress that change has caused in their lives, it is easier for them to relate to the stress their children will have dealing with the status change in their lives.

Students should be made aware that, in the face of major changes, feelings of inadequacy are not unusual. Instead, the university should make sure a student has access to information about multiple academic, personal, and social resources, so the student knows exactly where to turn in a time of need. Studies have demonstrated that as students begin to perceive the university community as advocating for their success, they will, as their parents have done, refocus and strive for positive outcomes, as opposed to giving up [26 - 30]. A supportive family environment, like a supportive university community, will also help a student through this time of self-doubt and inner reflection. Therefore, parents are encouraged to listen carefully to conversations with their student, remember their own insecurities and strategies for success in the face of change, and provide empathetic feedback.

C. Residence (Home to Residence Hall)

The new environment of the residence hall can take its toll on many students. The changes from living at home to living "on their own" in a residence hall, although they may appear obvious and/or trivial, can be very significant. We begin this change-in-living-environment discussion by asking parents if they feel the following issues will impact their child:

- How many times did your student clean the bathroom a month?
- How many times a month has your student cooked a meal for the family?
- How many times a night does your student open the refrigerator?
- How long would it take your student to spend $500 on junk food?
- Does your student have his or her own room?
- Who controls what is on the TV at night?
- What time does your student go to sleep each night?
- How much money is on the student's ATM card?

When we ask this question at the start of the presentation 95% of the parents say no it will not have an impact on their child's performance. They do not believe these types of issues will affect their children.

These living environment topics illustrate that the student will be experiencing a number of important lifestyle changes, as shown in our handout in Table 3. For example, the student will experience changes related to bathroom facilities, eating arrangements, diet, roommates and laundry. Moving away from home and into a residence hall also means major changes in the people a student interacts with every day. A student who has always had her own room or who has only ever shared a room with a sibling must now establish a positive relationship with a new roommate. Ideally, a friendship will develop, but before there is time for this to happen, new roommates must make agreements about playing music, about the TV, about mealtimes and food, about neatness, and—very important—about guests (especially the overnight variety).

TABLE III.
ISSUES REGARDING RESIDENCE

Home to Residence Hall New Environment	
•Lifestyle	
•Bathroom	
•Cafeteria vs. Kitchen	•Laundry
•Roommates	•Food
–Problems	•Relationships w/
–New Person	–Parents
	–Brothers/Sisters
	–Neighborhood friends

Students who were accustomed to the streets and neighborhoods of home, and to their parents providing a secure environment for their home, must learn to treat their residence hall room as their new home. It is now largely their responsibility that their belongings are secure and they must be aware of their own safety in their new home. Students must remember to lock their doors when they leave, even for a moment, and they must remember to keep their valuables out of easy sight. Students just coming to a large campus in a major city need to remem-

ber that when they go out at night, there is safety in numbers; they need to know where and when it is safe to be, and where and when it is much less so; and how and whom to contact if they feel there is some danger. Students need to understand that they are now the ones most responsible for keeping themselves healthy—they are now the ones deciding what goes in the mini-fridge; they are the only ones reminding themselves that staying up until 4:30 a.m. playing cards when they have an 8:00 a.m. class is not a good idea, nor is eating, for breakfast, the pizza that's been sitting on their desk for 2 days.

Our advice to parents is to assume their child is in college for at least 6 months before they leave. Make the prospective freshman perform the same functions at home that they will need to perform at college. By doing this parents can teach the student some basics, such as laundry, cooking, shopping for food, and waking up on time, and the students' already often stressful transition will not be further complicated by his lack of experience with wash his own clothes, shopping for things beyond junk food, or waking himself up on time. At the end of the presentation we post-test the parents with the same list that we used in the beginning of the presentation, now they are beginning to understand how the simple things the kids take for granted around the house can all of a sudden become a major issue in their lives, and the response has changed to where now 95% agree they must help their children make these adjustments.

D. Relationships (Old to New Friends)

Some of the most painful and enjoyable experiences of the first year of college involve personal relationships. The two major adjustments we are concerned with in the realm of relationships are shown in Table 4. Students must deal with all the relationships with people back home as well as with the new relationships that they are developing at the university. Most students are initially inclined to keep close relationships with people back home--with parents, brothers/sisters, neighborhood friends, and/or boyfriends/girlfriends. Our experience shows, however, that to be successful in their university lives, new students must connect with the new people around them. The objective then, is to assist first year students in moving on to new relationships.

TABLE IV.
ISSUES REGARDING PERSONAL RELATIONSHIP PROBLEMS

Old to New friends	
Concerns	*Get Help from*
Nothing in Common with Friends Back Home Boyfriend/Girlfriend Back Home	Student Organizations Counselors Academic Advisors TA's Professors Hall Managers Roommate Friends Boyfriend/Girlfriend

Before we begin this discussion about relationships with the parents, we ask them if they think the following statements will have an impact on their child:

- Is your student coming here with a friend from back home?
- Is your son's or daughter's best friend still in high school?

- Does your student have a boy/girl friend back home, and where will this boy/girl friend be during your son's or daughter's freshman year?

Typically only 45% answer yes thinking relationships will impact the student's grades. The transition from "friends from home" to new relationships at the university is another area parents can find difficult to understand. Termed "friend sickness," due to preoccupations with thoughts of friends and pre-college relationships, how the student deals with this transition can have long-term personal effects, and can potentially ruin a first year at college academically and socially [28].

Drawing from contemporary grief and bereavement theory, we pass on to parents that the best wisdom to share with a student is: expect to experience both physical and emotional separation from longtime friends, value past experiences with these individuals, but do not be afraid to move forward and find equally fulfilling relationships with new college friends [29]. Parental advice should be grounded in the knowledge that any student may experience "friend sickness" to some degree, and parents should be prepared to assist a student in moving on by providing plenty of time to talk about the transition and be very welcoming to new college friends. A parent's best advice can be stories of lost friendship due to moving for jobs or to people growing apart. Parents from divorced families can use their own experience of the pain (and freedom) of separation to help their first-year student understand the feelings of loss and of opportunity that come with moving to a new place and developing new social circles.

The biggest concern of all parties should be to make sure the fear of a lost relationship does not impact the future career choices of the student. One of the main areas we discuss relating to relationships and academic/career choices is the situation in which two students that are close friends from high school enter their first year, and one is pursuing engineering but the other is not. By having the peer mentors discuss the differences in study habits and time commitment between different degrees (with engineering demanding more study time, and, with labs, often more class time), we let parents know that students will have to deal with questions such as: " if your friend is out 'playing', do you study or go 'play?'" We emphasize that students will have to sometimes choose between the "old" and the "new": "should you go home on weekends to be with your old friends or is it better to stay here and make new ones?" We advise parents on how to get their daughters and sons to discuss these questions. We have found that if the parent and student can discuss these issues before the start of school, many of the tough choices and tough decisions can be made before the issues of old and new relationships, of loss and opportunity create academic problems. At the end of this section of the parent workshop, 99% of the parents agree that relationships can be a major issue in the life of their child and that they will have substantial discussions on the topic with their child.

E. Failure (Reactive to Proactive Approach)

We ask parents, "do you think your son's or daughter's past success will guarantee success in college?" Only 12% say yes. We ask, "will your son or daughter skip classes to sleep or to do other activities? 56% say yes. We continue with, "how many hours a week did your student spend on homework each week?" 11% of the parents say zero; 80%

of the students say zero. This sets the table for our discussion on failure. Table 5 lists some of the problems and solutions we discuss with both parents and students regarding failure. For many students, failure comes in many different forms. For some students, failure can mean dealing with less-than-perfect grades, not necessarily poor grades. Many students find getting a "B" means failure, since they are accustomed to only getting an "As." For other students, failure looms when they find themselves dealing with different learning and teaching styles, or dealing with previously developed study skills and habits that do not work in engineering school.

Dealing with failure is difficult for anyone to handle. Failure—whether it is perceived as immanent or whether it is an actual possibility--coupled with the additional pressures of the first year, can have a major impact on a student's personally perceived potential. The most compelling advice we can supply to both students and parents is to simply be able to easily locate and fully understand the policies and procedures regarding initial poor academic performance, and know all the options and support systems that are in place to assist a student through perceived or actual poor performance. Understanding options can open doorways otherwise perceived as closed. Additional discussions on grade or program options can provide fuel to a student/parent conversation, which inevitably fuels the productive mutual reciprocity loop [27].

TABLE V.
ISSUES REGARDING FAILURE

Students must Take Control of Their Life	
Grades	•Get Help from
Different Learning Styles	–Student Organizations
Study Skills	–Counselors
Internet abuse	–Academic Advisors
TV/Video games	–TA's
	–Professors
	–Hall Managers
	–Roommate
	–Friends
	–Boyfriend/Girlfriend

When discussing academic performance with students, we remind them that they came here to get a degree and to follow their lifelong career plans, so, we emphatically advise them, "GO TO CLASS!!" Doing homework is not a dumb requirement imposed by unreasonable teachers, but a wise policy to follow for all courses—even if a student was used to doing minimal studying and homework in high school. Students should expect to spend more time on their homework than they consider normal. If they spent 4 -5 hours a week on homework in high school, they should expect to spend 4 - 5 hours a day in college.

Students should also take advantage of the wide range of support in the form of meeting with faculty and program advisors, working with a tutor, attending study sessions, and, if needed, contacting the Counseling Center. We emphasize that all these support people have experience not only in the academic subject at hand, but also with the academic rigor and the major changes of the freshman engineering year. Parents can help by having discussions about times when they had to seek help at work or school and how asking for help becomes easier the more often you do it. Needing assistance with class work and the associated study skills and time management is not a sign of weakness but is a sign that you are wise

enough to know when you need help. Once again, at the end of this session, 99% of the parents agree that they will sit down and relate their life experiences with their children.

V. SUMMARY AND CONCLUSIONS

As noted, in the pre test survey of the parents 63% of the parents said the student filled out the application form, only 13%of the students asked all the questions during the college visits, only 24% of the parents said their kids do the laundry by themselves, and 38% said the kids have never done the laundry, only 59% of the parents say their child can get up by himself or herself in the morning, only 47% of the kids have experience with an ATM card. Obviously once the kids get to college they must do 100% of all of these types of activities. Most parents don't make the connection between being there for their kids and over protecting their kids. These types of questions show the parents they need to discuss life issues with their children. When asked how many times has their son or daughter been drunk or done drugs, or how many times has their kid had sex? 21% and 41% respectively stated they don't know or are afraid to ask. Again these are real issues for students and they need lessons on these life issues that the parents should discuss. Our parent workshop allows the parents to see the value is having open communication lines between the parents and the students.

The parents say 98% of the kids are involved with extra activities and 64% say their kids will consider themselves important. Do the parents think this possible status change will be an issue? Not before we start talking with them, but they do by the time we are done, see Table 6. In addition, to changes in status, the student will also experience changes related to bathroom facilities, eating arrangements, diet, roommates and laundry. There are also major issues related to personal relationships, and old friends versus new relationships and new friends. Finally dealing with failure in the form of grades, relationships, and status can have a profound impact on young children. These are all life changes that can impact a young adult. However, 94% of the parents admit they lived through life changing issues so they agree they are prepared to discuss change when their child starts experiencing problems with adjusting to a new life style.

TABLE VI.
CHANGES IN PARENTS ATTITUDES

Changes between pre and post test results	
Pre test	Post test
Did you drink before you were 21: 2% yes	Did you drink before you were 21: 85% yes
Did you have sex before married 2% yes	Did you have sex before married 85% yes
Will living arrangements have an impact on your child: 95% No	Will living arrangements have an impact on your child: 95% Yes
Will relationships impact the student's grades: 45% yes	Will relationships impact the student's grades: 99% yes

By the end of the presentation 98% of the parents agree they must have a serious talk with their children about life lessons and choices.

As a result of our orientation workshops' emphasis on interaction between parents and students through the first year of engineering school we were concerned that some students might view such ongoing parental input as a neg-

ative influence. To monitor whether or not students felt unduly pressured by their parents, as a result of the parents' interest in and communication with many aspects of their first-year students' experience, we survey the students at the beginning and end of the first year. Two of the statements the students respond to are: "My parent(s) are making me study engineering" and "My parent(s) want me to be an engineer." On a scale of 1 to 5 (Strongly disagree to Strongly Agree) the score on these two questions has been 1.4 and 3.0 respectively. These responses strongly indicate that even with all the interaction we are producing between the parents and their first year engineering students, the student does not feel they are being forced into engineering and are neutral on the issue of staying in engineering. The feeling the students are getting is their parents are concerned about their future, are available for useful, empathic support and advice while trusting the students in their decisions.

We started working with students and parents and discussing the various transitions issues many years ago. During that time we have also made a number of changes in the freshman curriculum, making it difficult to isolate just one aspect of the Swanson School Freshman Program that has produced the results we have observed. However, we believe the addition of parent and student workshops focused on key transition issues has had a large impact on our retention and student performance.

Comparing the average of student performance for the time period before we initiated the parent workshops with the current performance average shows that percent of students that made honors increased from 20% to 30%, the percent of students placed on probation dropped from 20% to 10%, and the first semester GPA increased by 0.5. A final method of assessing the impact of discussing the various transition issues with the students and parents is to survey the student attitudes regarding their choice of pursuing engineering at the end of the freshman year. The method used is the Pittsburgh Freshman Attitudes Survey [32 - 34]. The survey is based on a scale of 1 to 5 (Strongly disagree to Strongly Agree). Table 7 gives an example of some of the results from that survey.

TABLE VII.
COMPARISON OF STUDENT ATTITUDES

Question	Score
I expect that engineering will be a rewarding career	4.54
I expect that studying engineering will be rewarding	4.30
The advantages of studying engineering outweigh the disadvantages	4.15
The future benefits of studying engineering are worth the effort	4.35

We believe the positive responses to these survey items further supports the concept that students are happy with their choice of careers and are making a positive transition from high school to college.

Academic research indicates that increasing students' and parents' awareness of potential first year pitfalls, leads to better communication and cooperation, which, in turn, leads to increases in student retention. Simply stated, if the academic community embraces the family unit, academic, family, and personal transitions become more manageable [31]. Our research supports this finding.

Pitt's assertion that a heightened level of familial support leads to an increased level of student adjustment/success is supported by our increasing freshmen persistence rates. Although these discussions were one of many new actions taken by the Freshmen Engineering Program over the course of the past decade, the workshops are most often followed by a flurry of positive feedback from parents. The value of bringing parents fully into realizing and discussing essential transition issues is substantiated though out the academic year, as both parents and students often refer to materials and resources shared during such workshops.

Adolescence is indeed a tenuous period for all students. Recognizing the many challenges young adults arrive with as their first year gets underway is only part of the pre-college preparation process. Families, as well as students, must be educated on transitional challenges, must be fully aware of university resources that support the students through these transitions, and must understand that the family itself, can be a tremendous support, without stymying the student's opportunities to grow and learn . Actions such as the Swanson School's workshops for parents have been documented as easing challenging transitions, by facilitating discussions that address such students' concerns and strengthen participant relationships. Essentially, when a communication continuum is fostered that encourages students and their parents to begin proactively planning for college, student persistence is often the result.

VI. REFERENCES

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[35] Responses from clicker survey during summer parent workshops

AUTHORS

Dan Budny is a faculty member and Academic Director of the First Year Engineering Program at the University of Pittsburgh, Pittsburgh, PA, 15261, USA. (e-mail: budny@pitt.edu).

Cheryl A. Paul, is the director of the staff advising program within the First Year Engineering Program.

Beth B. Newborg is the director of the University Writing Center.