

## **Empowering Graduates to Manage Professional Careers for Greater Satisfaction and Contribution**

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### **Introduction**

Recent reports aimed at improving engineering education are consistent in recommending new attributes for future graduates.<sup>1,2</sup> These attributes are in addition to the strong technical capabilities for which engineers have been known and are frequently referred to as the ‘soft’ skills. They include:

1. An ability to function on multi-disciplinary teams.
2. An understanding of professional and ethical responsibilities.
3. An understanding of how engineering solutions impact society.
4. An understanding of contemporary issues.
5. An understanding of the need for lifelong learning.
6. An ability to provide effective and skillful leadership.

A variety of topics fit under the broad umbrella of these attributes. One key topic that has proven to be extremely useful to engineers is an understanding of how their careers will develop in today's organizations. With flatter organizational structures, opportunities for upward advancement have decreased and more emphasis has been placed on efficiency and customer-satisfaction. These changes in organizations have modified career development for the engineers that staff them. The traditional ‘how to succeed in business’ strategies no longer work. This can lead to frustration and confusion for today’s engineering graduates. Yet organizations' need for leadership -- in the form of expanded influence from their engineers and others -- has increased. Engineers need to understand these concepts in order to manage their careers for greater satisfaction and contribution.

A research-based framework developed by Professors Gene Dalton and Paul Thompson called the Four Stages<sub>SM</sub> Model has been used by the Novations Group to help careerists understand how their employers expect them to grow and develop over the course of their careers.<sup>3</sup> The model has proven invaluable to practicing engineers. It would seem that helping students understand these concepts before they left the university would accomplish two goals. One would be to teach material related to one or more of the attributes listed above and the other would be to empower graduates to take more control of their own career development.

The objectives of this paper are: 1) to provide a brief review of the Dalton-Thompson Four Stages<sub>SM</sub> model and other related concepts; and 2) to present a module for use in teaching students the concepts of how to manage their own careers. The paper will also present student reaction to the teaching of this material.

### **Review of Four Stages<sub>SM</sub> Model and Related Concepts**

In the late 1960s, Harvard Business Professors, Gene Dalton and Paul Thompson, began a study of performance measures of professional people in organizations.<sup>3</sup> Their original research, which included over 2500 engineers and has been replicated repeatedly over the past 20 years, showed the following:<sup>4-9</sup>

1. The average performance ratings of engineers rose steadily until the mid to late thirties and then began to decline as shown in Figure 1. The most recent data show that the peak has shifted to the early forties.
2. Many individuals were able to remain highly valued contributors throughout their careers.
3. Individuals perceived as high performers in the later stages of their careers performed different functions than those perceived as high performers in the early stages of their careers -- and that these late-career functions had less to do with technical brilliance than with organizational influence and technical leadership.

These observations led to the development of the Four Stages<sub>SM</sub> Model. The stages reflect the needs of organizations to have varying job assignments performed by individuals as they earn trust and respect from their peers and supervisors over the length of their careers. The stages differ in tasks, in the types of relationships that individuals form, and in the perspective that they have. Table 1 summarizes the characteristics of each stage.

Learning how to follow comes before learning how to lead. That's the essence of Stage I. In Stage I, a person is expected to accept supervision and direction willingly and to exercise initiative and creativity within a well-defined area. Ideally, a mentor is provided to help teach the approaches, the organizational savvy, and the judgment not found in textbooks. While it is important to stay in Stage I long enough to build a solid foundation and to earn the trust of others, people who stay in this stage indefinitely will, over time, become less and less valued in the organization. People can't spend an entire career in Stage I unless they want to be a perpetual 'intern'.

Most individuals look forward to having their own projects or areas of responsibility. Earning this opportunity and taking advantage of it moves a person into Stage II. Think of Stage II as the time to build a solid technical foundation -- essential for building a long-term career. In this stage, peer relationships take on greater importance, especially in a team context. People in Stage II are true team players, pulling their weight without the need for a lot of guidance, and willingly sharing information with their fellow team members. Stage II individuals rely less on their supervisor or mentor for direction, and more on their fellow team members. In fact, they begin to resent being "micromanaged." This stage is an extremely important step in one's development. People should resist the temptation to rush through Stage II. If they move too fast into a management or leadership role, they'll find they don't have the credibility necessary to make broader contributions. Stage II is a key decision point in a career, however. Many people find that they prefer a "leave me alone and let me do my work" type of role. Indeed, the most readily identifiable role in most organizations is the independent contributor -- the expert or specialist working as a member of a team. This "hired gun" philosophy is fraught with peril, however. Continued recognition and reward requires staying at the "cutting edge" of the discipline, and the continued strategic importance of that discipline to the organization. A person may be able to control the former, but the latter is beyond his/her influence.

The key to Stage III is the ability to “contribute through others”. This doesn’t necessarily mean managing or supervising other people. Recent research from 10 technical organizations shows that non-supervisors outnumber supervisors five to one in this stage. The roles most often played by people in Stage III are: coach; informal mentor; project or team leader; idea leader; and internal consultant. As Table 1 shows, a move into Stage III requires shifts in multiple activities including: developing a greater breadth of technical skills and then applying those skills in several areas; building a network of people outside the workgroup and using the network to help get work accomplished; and becoming involved in the development of people. Stage III requires strong interpersonal skills. A person needs to be able to build the confidence of co-workers and not feel threatened by the success of others. One dilemma for technical Stage III’s is that they’ll find themselves pulling away from technical work. The question is: How far? Some make a great effort to stay close to their field. Keeping a foot in each camp is hard to do long-term. Eventually, they’ll have to let go of some of the hands-on technical work in order to be successful in a broader Stage III role.

Not many people progress beyond Stage III but employers need some to in order to provide the high-level leadership that will define the future. Table 1 lists the characteristics of what it takes to move into Stage IV. Many technical contributors find ways to play a Stage IV role without moving into management. These include:

1. The idea innovator. These people influence the future of the organization through original concepts that often lead the organization to change the way it does its work. Their influence is based on a reputation for achievement and a keen sense of what builds the organization’s ability to compete in the marketplace.
2. Internal entrepreneur. These high-energy people are adept at seeing new business opportunities, then assembling the buy-in, money, and staff to pursue new product ideas and other business objectives.
3. Sponsor. Sponsors influence the direction of the organization through the selection and development of key people. A sponsor keeps an eye out for competent people, then gets them placed in key positions where they will be tested, challenged, and have the opportunity to prove themselves capable of making decisions affecting the organization’s future. In comparison to the mentor role in Stage III, the sponsor role requires less frequent contact and is probably a more distant relationship.

Often, individual contributors who are in Stage IV have a reputation outside the organization through their achievements and/or publication. Another characteristic of people in Stage IV is their extensive network of relationships outside the organization. A critical shift for those moving into this stage is a broadening of perspective and a lengthening of time horizons.

In addition to teaching students the stages model, the authors have found it extremely beneficial to include information regarding plateauing, career bests, career orientations, feedback, and a change process. These will be briefly defined before introducing the teaching module.

Plateauing occurs when a person reaches a state of no growth and/or movement. There are two kinds of plateauing:<sup>10</sup>

- position - the end of promotions (i.e., no significant increases in level, status, or formal power).
- contribution - stagnation in terms of personal growth and hence, contribution.

Position plateauing will happen to everyone, even the CEO will run out of positions to climb. It doesn't always bother everyone since not all people are anxious to move up the managerial ladder. With the flattening of organizations that has occurred in recent years, there are fewer management positions and hence more people are feeling the affects of position plateauing earlier in their careers.

Contribution plateauing is more damaging to both the individual and the organization. Individuals are hurt because they stop learning and growing. Organizations are damaged because productivity and motivation drop. However, contribution plateauing does not have to happen to anyone. An understanding of the stages model and how careers develop can help people prevent this from occurring.

A career best is defined when the job assignment that an individual is performing matches three things: organizational needs; individual talents; and individual passions. When these three items are in alignment, individuals feel highly satisfied with their work and experience growth that builds new skills and abilities. The organization benefits also from a career best since its needs are being met by a productive and motivated individual. The only problem with career bests is that too often they happen by chance. They aren't deliberate or purposeful events. Teaching students how to design a career best will make them more valued by their future employers and lead to higher job satisfaction.

Learning how to design a career best involves learning about an individual's passions.<sup>11</sup> People are motivated by different ideals. Some are motivated by a desire to get ahead. Others are more concerned about balancing their lives between work, family, church, and/or civic responsibilities. Knowing and understanding what motivates them will help people put in alignment the three aspects of a career best as defined above.

The last concept to be included in the teaching module is feedback and how to use it to initiate change.<sup>12</sup> The stages model implies that individuals are required to make changes in abilities, relationships, and perspectives during their careers in order to remain highly valued within their organizations. The responsibility to change lies with the individuals, not with the organizations with which they work. To facilitate change, it is helpful for people to become aware of how others see them. Feedback allows people to compare their own perceptions of their performance with the perceptions of their supervisors and others. Teaching students how to accept feedback and then how to use it to help make appropriate changes will help them to learn how to manage their own careers.

## Varying Length Teaching Modules

This material normally makes up 2/3 of a day and half workshop. Attempts have been made to condense the material for presentation within a university course so that a minimum number of lectures would be required. Two different length modules have been piloted – a two-hour workshop to a class of MBA students and a 50-minute seminar to 21 senior chemical engineering students. While student feedback from both pilots was obtained, the feedback from the 2-hour workshop was limited to written comments. Table 2 contains a sample of the most pertinent student comments from this workshop. A feedback form was designed for the 50-minute seminar and the results are presented in Tables 3-5. The information in the tables

indicate that student response to the teaching of this material was extremely positive.

The MBA students were a little more familiar with organizations and how careers develop within those organizations. The comments listed in Table 2 indicate that the workshop provided some insights that had not been covered in regular course material. However, for some of the students that was not enough. They wanted to hear more about how to apply the concepts. A longer workshop would have allowed more application and more case studies from which to learn.

Undergraduate engineering programs do not allow a lot of time for the inclusion of this type of material. For this reason, one 50-minute seminar containing a brief overview of the material was piloted. Tables 3 and 4 contain the results of a pre- and post-questionnaire given during the seminar to determine a measure of the students' understanding of the concepts. The questionnaire was made up of 4 true/false questions and 6 statements involving a 5-point scale where the students had to indicate whether they disagreed or agreed with a particular statement. The answers to the true/false questions, shown in Table 3, indicated improved understanding of how careers develop. However, one question regarding job assignments was not completely answered in the students' minds. This may reflect the shortness of the contact time with the students and the need to rush through the material in the seminar format. The responses to the 6 statements, shown in Table 4, again indicated that after the presentation there was better understanding of careers and of the self-management of careers. Before the presentation, the students responded that they slightly disagreed or were fairly neutral with the statements. After the presentation, the students were in much more agreement with the statements. However, since the seminar did not leave enough time to discuss the implications of the Four Stages<sub>SM</sub> Model and the feedback/change process, the students were not as comfortable with the ideas of how to manage their careers as they could have been with more coverage. This is indicated by the responses to statements 3 and 4 and the verbal questions that the students asked during and after the seminar.

At the end of the seminar, the students were asked to evaluate the information presented to them. Table 5 contains responses that students gave when asked whether they disagreed or agreed with a particular statement. The students agreed that the material was useful and that it should be taught in the curriculum. However, in an open question regarding where it should be taught, the students were in less agreement. Some felt that it should be taught in a senior seminar, some felt that it needed to be presented earlier in the curriculum, and some felt that it should be treated as a series of seminars for the student chapter to sponsor. In another open question -- Do you feel the concepts presented are applicable? If so, how? -- the students provided the following responses:

- Yes, it inspires one to be more excellent - not to stagnate - in anything.
- They reveal more specifically what to focus our efforts in, to develop ourselves.
- Yes, we need to know what's going on in the workplace.
- Yes, useful when I start a job.
- Yes, I think they give the person a better handle on his/her job and how to control it.
- Definitely, a career is not based only on technical skills.
- True, I have seen them.
- Yes, technical skills are good but communication and creativity are sometimes far more important to the contribution.

- Yes - big picture.
- Yes, I liked it.
- Yes, I like to hear about how people become important to their corporations.
- Yes, better understanding of where I am and where I can go and how.
- Very applicable.
- Yes, try to understand what you're getting into.
- Yes, we get educational training but not any career training.
- Yes, the responsibility for a successful career lies with the individual.

From the student response to the two modules, the authors feel that more time is needed to adequately present enough material to provide students with both an understanding of how careers develop and a knowledge of how to manage their careers. As a result, a teaching module containing 4 50-minute sessions has been designed and is suggested as the ideal approach to teaching this material. This is still only about half the time that it is required to present the subject matter to careerists in a normal 1 and 1/2 day workshop. Obviously, more than 4 sessions would allow deeper coverage of the material and would result in greater understanding by the students. Less time than this, however, will leave too many questions in students' minds. For instance, two periods are long enough to present the stages model but not long enough to allow the students to learn how to use the information to help manage their careers without a significant investment of effort in out of class study.

Table 6 contains an outline for each of the 4 class periods. The first two periods of the module contain information regarding the stages model. The remaining two class periods are used to present the concepts of career bests, career orientations, and feedback/change. This material will provide a basis for the students to help manage their own careers.

## Conclusions

The authors have used a research-based framework called the Four Stages<sub>SM</sub> Model to help students understand how their employers will expect them to grow and develop over the course of their careers.<sup>3</sup> The following conclusions are drawn from this work.

1. Two different length teaching modules have been piloted. From the results of these two pilots, a module consisting of 4 50-minute class periods has been designed. This is sufficient time to adequately present material that will provide students with both an understanding of how careers develop and a knowledge of how to manage their careers.
2. Students' comments suggest that they are not taught these concepts in normal engineering curriculums but feel both a need and a desire to learn them.
3. Helping students understand these concepts before they leave the university to enter the work force accomplishes the dual goals of teaching an ABET attribute and, more importantly, of empowering students to take more control of their own career development.

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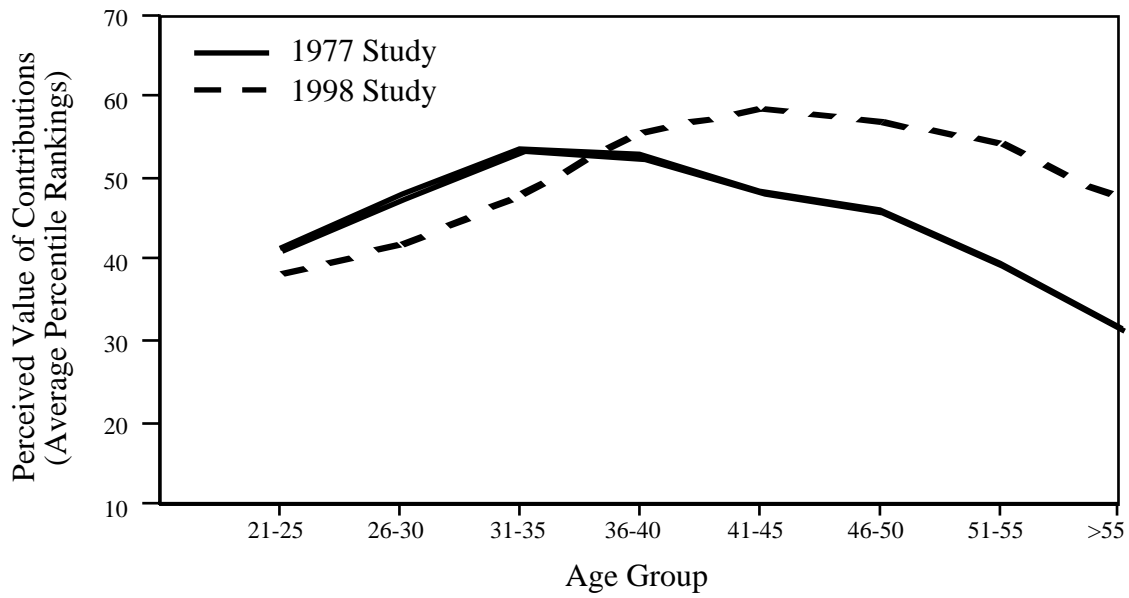


Figure 1. Managers' Assessment of Employee Contribution versus Age Group



Table 1. Stage Characteristics

**Stage I**

*Depending on others*

Willingly accepts supervision and direction

Demonstrates competence in a portion of a larger project or activity overseen by more senior staff

Effectively performs detailed and routine work

Shows “directed” creativity and initiative

**Stage II**

*Contributing independently*

Demonstrates technical competence, credibility, and a reputation for good work

Works independently and produces results

Assumes responsibility for a definable portion of the project, area, or clients

Relies less on the supervisor or mentor, developing his or her own resources to solve problems

Builds collegial relations with co-workers

**Stage III**

*Contributing through others*

Demonstrates a breadth of business or technical understanding and insight

Stimulates others through ideas and knowledge

Develops and influences others: as an idea leader, an internal consultant, a mentor to more junior staff, a manager, etc.

Builds a strong network of organizational and industry relationships

Deals with the outside on behalf of those inside the work group (*e.g.*, with clients, other work groups, industry associations, upper management, etc.)

**Stage IV**

*Leading through vision*

Shapes the direction of the organization

Effectively exercises power for the benefit of the organization by initiating actions, influencing key decisions, or obtaining important resources

Uses the tools of the organization to obtain organization commitment and results

Sponsors promising individuals to test and prepare them for key roles in the organization

Represents the organization both internally and externally

Table 2. Sampling of Student Comments from the 2-hour Workshop

**In response to the question: Did this workshop deliver what you were expecting? If not, why?**

Yes, the workshop was very helpful. It discussed some ideas that I suspected might be true. I had not realized that others had studied these ideas in depth. This could be very useful in trying to develop one's own career.

While the Novations workshop was interesting, it did not meet my expectations. I would have liked to have seen how people can prepare to go to the next stage, not what the stages are. That would have been much more useful.

I came with no expectations other than it would probably be helpful and interesting, and it fulfilled those.

I went to the meeting to hear about career plateauing and I would say that the workshop was successful.

I did not have any expectations of this workshop. I felt engaged and stimulated.

Yes, it was very helpful. The seminar provided excellent incite into the trends of corporate career planning, especially in light of the downsizing of management positions.

It was helpful to see the four stages but I felt that the majority of the presentation was spent on sharing research results rather than how to beat the curve, which was the title of the presentation.

Yes. Gave great framework to think about where and how to plan for career development.

Yes, I believe it did. I learned a framework for assessing career growth and the skill sets needed at each stage of my career.

Table 3. True and False Questions and Results from Pre- and Post-Questionnaire of the 50-minute seminar - 21 Respondents

**True and False Questions**

1. Your perceived value to the organization is unlikely to decline as long as your performance doesn't decline.
2. The job assignment and what you make of it are the most important variables in career development.
3. Your career growth is primarily dependent on the systems and structures of the organization.
4. The primary way to remain highly valued over time is to concentrate on performing technical skills well.

**True and False Questions - Results**

Question	Correct Answer	Pre-Questionnaire		Post-Questionnaire	
		True	False	True	False
1	F	11	10	1	20
2	T	14	7	15	6
3	F	7	13	1	20
4	F	6	15	0	21

Table 4. 5-Point Scale Statements and Results from Pre- and Post-Questionnaire of the 50-minute seminar - 21 Respondents

**5-Point Scale Statements**

Please indicate the extent to which you agree or disagree with each statement:  
 (1 = Strongly disagree; 3 = Undecided/neutral; 5 = Strongly Agree)

1. I understand the factors that influence my career opportunities.	1	2	3	4	5
2. I understand how the careers of people develop in organizations.	1	2	3	4	5
3. I feel confident about the role I take in managing my own career.	1	2	3	4	5
4. I know how to deal with the issue of career plateauing.	1	2	3	4	5
5. I know how to increase my value and contribution in future jobs.	1	2	3	4	5
6. I know how I could grow in my job, even without opportunities for promotions.	1	2	3	4	5

**5-Point Scale Statements - Results**

Statement	Pre-Questionnaire	Post-Questionnaire
1	3.05	3.95
2	2.71	3.95
3	3.14	3.81
4	2.48	3.76
5	3.00	4.05
6	3.10	4.14

Table 5. Student Feedback from Seminar Evaluation

**Evaluation Statements**

Please indicate the extent to which you agree or disagree with each statement:  
(1 = Strongly disagree; 3 = Undecided/neutral; 5 = Strongly Agree)

- |  |   |   |   |   |   |
|--|---|---|---|---|---|
| 1. The seminar provided information that I have not had before in my college career. | 1 | 2 | 3 | 4 | 5 |
| 2. The seminar information will be useful for me in my career.                       | 1 | 2 | 3 | 4 | 5 |
| 3. The seminar information should be taught in the Chemical Engineering curriculum.  | 1 | 2 | 3 | 4 | 5 |

**Student Responses**

Statement	Response
1	4.33
2	4.39
3	3.94

Table 6. Outline for Four 50-minute Period Teaching Module\*

**Day 1**

Plateauing

- definition - position and contribution
- danger of contribution plateauing

Stages Model

- Perceived value of contribution vs age
- Early research
- Importance of job assignment
- Development of Four Stages<sub>SM</sub> Model
- Characteristics of each stage

**Day 3**

Career bests

- Definition
- How to plan for career bests

Career orientations

- Learning about individual passions
- People are motivated by different things

**Day 2**

Stages Model continued

- Career stage growth
- Primary focus changes
- Making a novation between stages

Implications of Stages Model

- Career growth
- Value of contribution
- Gender and ethnicity

**Day 4**

Feedback

- Importance of feedback
- How to respond to feedback

Change

- Development plans
- Making a novation revisited

\* A student monograph is available from The Novations Group at: [www.novations.com](http://www.novations.com)