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Case Study

### **Introduction:**

I currently have Mr. Subject in my Automotive Brakes Theory and Lab and Industrial Math classes at Jefferson High School. I had Mr. Subject in my fall 2007 Introduction to Basic Automotive Systems and Service Theory and Lab. I have worked with Mr. Subject for one semester already. Mr. Subject presents some conventional problems and he came with a Special Services Accommodation Request. I received a copy of this from the Jefferson High School Counselors' office. Mr. Subject and I did not discuss this request and it did seem to bear some resemblance to Mr. Subject's ability to perform academically. The Request indicated that Mr. Subject suffers co-morbidity in that he has more than one area of documented disability. These include some disability involving reading and organization. The request indicated that he may need help with note taking and testing. Specifically, extended time for tests, tests read aloud, and spelling problems.

These potential learning problems increased my interest in evaluating and developing a plan of instruction to accommodate Mr. Subject and others of his comportment. I intend to design a program that will accommodate all students. Mr. Subject is not alone and improvements in the instruction could help all students.

### **Initial Profile:**

Mr. Subject is unremarkable within the student body at Jefferson High School. He is average based on his 1<sup>st</sup> semester grades. Mr. Subject earned a 68% (D+) overall, compared to a 75% for his cohorts. I understand he lives with his mother and a Step-father. Certainly not uncommon today. Mr. Subject is a junior and still has no fixed plan for after High School. As I performance counsel all students using the 5 minute office call, I had spoken with him 4 times during the first semester. Sessions generally consisted of examination of the current grade and future improvement or pending assignments. There again, Mr. Subject displayed no unusual issues.

Mr. Subject was also counseled about mid-term regarding his professionalism, at the behest of his mother, regarding his spotty attendance at an ensuing class, Gym in this instance. I explained the curriculum rationale and demanded that he attend and participate in the Gym class in no uncertain terms. I always require a student to behave professionally in conjunction with other pursuits when it is presented to me. This was agreeable and his mother later reported that the problem was solved.

Academically Mr. Subject is not very good at taking written exams. This is borne out by his performance during the first semester. His average on written exams was around 47% with his cohorts averaging 62%.

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No accommodations were asked for or initially granted during the entire 1<sup>st</sup> semester. Class Assessment from Mr. Subject indicates he desired more hands on Lab work and testing. If Mr. Subject is indeed a non-reader or a slow reader, this difficulty on in-class exams makes sense. I have absolutely no doubt that Mr. Subject has absorbed enough information to merit a 68% overall. Mr. Subject demonstrated his Lab ability by averaging a 90% in this category. Mr. Subject turned in an unusually poor grade in written exams and this really hurt his grade.

### **CAT (Classroom Assessment Technique) plan:**

I had already administered 3 CATs and the obligatory SPOTS survey during the first semester.

During the first week, I administered an initial One Minute Survey that asked the student to provide information about what the student wanted to learn during the upcoming semester. I used this to focus the student on possibilities and then conducted a class discussion and had each student introduce themselves. The class discussion focused on class content, success, home work, exams, and basic weekly outline and assignments. This was rather more of a meet and greet and my agenda was twofold: Develop a friendly learning environment and set up conditions and standards for successful completion of the class. This also helped set the tone for the semester.

Around Mid-Term, I collected information on the semester research project. I had required the students to choose an Auto related topic and deliver a structured research paper covering the information assembled from research. The project also required an early draft overview and a final product with diagrams and pictures. The project was used in lieu of a final exam. Mr. Subject conducted his research and used printed web site documents as an overview. This was acceptable and his final project gleaned a 90%. Students were encouraged to work together and trade information regarding the project. Mr. Subject worked closely with another student and they turned in similar papers.

The research paper CAT was unremarkable in that the students' answers were a montage of similar answers. Learning and reporting something new was unavoidable. I was rather more concerned about structure, presentation and organization.

I collected semester information using a Group Instructional Feedback Technique (GIFT) CAT. This was administered during the final week of the semester, but before each student knew what their final grade would be. A compilation of the results suggest several issues. Most students desired more Lab time. The group sheets merely recapped each individual concern and not a true consensus arrived at through discussion.

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Mr. Subject liked the classroom slide shows and the pre-exam reviews. Mr. Subject also showed a proclivity for more use of power tools. But, as with most students, Mr. Subject really wanted to inject more fun into the class. Not unusual, but difficult to accomplish and still train to standard.

### **Assessment of CATs:**

While the CATs certainly gave a snapshot of where the class was at any given period, I feel there needs to be more in-depth research conducted. In the case of Mr. Subject, I could conduct all class material and testing in the Lab. This would relieve him of reading the associated texts involved with the class and retaining any usable material through theory. I suspect that some students would not benefit to the degree Mr. Subject would from this structure. So we arrive at “now what?”

Fundamentally then, my original model for the class may be defined as:

- a. Student reads assigned and associated classroom theory from assigned text.
- b. Discuss theory and material during slide and white board presentation.
- c. Observe, identify, disassemble, assemble, and grasp Lab material and related assignments.
- d. Review and demonstrate knowledge and understanding of theory and material on a written or hands-on exam.

I’m not sure how I modify this model to help Mr. Subject.

### **Classroom Observations:**

As stated before, Mr. Subject is rather unremarkable and is very typical of most of this class. For comparison and contrast, I will list positive and negative classroom/lab behaviors I have observed.

#### *Positive assets:*

Polite  
Alert  
Good attendance  
Open to new ideas  
Willing to learn  
Cheerful

#### *Negative means:*

Low attention to detail  
Socially preoccupied  
Unsure of self  
Group-dependent  
Unordered  
Not determined to succeed

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Some of Mr. Subject's other attributes that are neutral would include:

Visually oriented, computer savvy, and usually busy.

These combinations reasonably describe Mr. Subject and his academic resources, at least from my humble observations. Some of these qualities stem from being seventeen and semi-dependent. Mr. Subject may be described as unsure and group dependent. This manifests itself through pairing in lab and classroom activity. Learning seems to be accomplished, if at all, by committee. Mr. Subject may need to accomplish something before he feels adequate. He has accomplished much in the lab but may need to extend this to the classroom through better test results.

### **Possible Hypotheses:**

I have developed two related hypotheses regarding Mr. Subject and his low Test scores.

1. Mr. Subject does not effectively read assignments, and therefore is unable to answer test questions regarding the assignment.
2. Mr. Subject is a slow reader and the pressure of a test leaves him unable to read questions and recall answers from the reading assignment in a timely manner.

Both hypotheses are valid only if Mr. Subject actually attempts to read the assigned reading assignment. As stated before, Mr. Subject may have a disability with reading as his counseling report indicates. I was never sure that this was the case and I have devised a way to assess his ability. This is how I set it up.

If Mr. Subject suffers from a slow reading problem, taking an oral quiz should allow Mr. Subject to score higher on the same series of questions. I assembled a chapter test with ten (10) questions and an oral quiz that had five (5) questions culled from the original test. I read this oral quiz aloud and had the class provide answers on a sheet of paper. One day later I administered the chapter test in the regular fashion.

I supposed that Mr. Subject would score better on the oral quiz. This would tend to indicate that Mr. Subject does indeed read slow, but could perform better if the questions were read to him.

This did not prove to be the case. Mr. Subject scored a 60% on the oral quiz and a 100% on the regular written test on the same five questions. This sort of points out that Mr. Subject does not read the assigned material with enough comprehension and merely reading the questions during a quiz does little good.

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In order to fully verify a slow reading issue, one must ensure that Mr. Subject has attempted to read the assigned material. I assign review questions from the end of the chapter and these are due before the test. Mr. Subject generally fails to complete this assignment. I will work on getting him to complete these review questions. I will conduct a modified quiz/test experiment again during the week of 4 through 8 February.

The modification will include similar questions with the same answer on the quiz and the test. The original experiment used the same questions with the same answers on both. This may shed further light on this perplexing and persistent problem.

The chapter 4 quiz was administered on the 5<sup>th</sup> of February. Mr. Subject scored a 60% (3 of 5) on the quiz. The chapter 4 test was administered on the 8<sup>th</sup> of February. Mr. Subject scored a 60% (3 of 5), same questions right and wrong, on the test. Additionally, Mr. Subject failed to accomplish the review questions at the end of chapter four.

**Summary of Findings:** I'm reasonably convinced that Mr. Subject does not read the assigned material from the text book. Repetition in the classroom helps Mr. Subject understand the material, to the extent that he understands any automotive theory espoused during lecture and testing. The two hypotheses that I put forward are null. This is so because Mr. Subject fails to read the assignment. More work needs to be done to ensure that Mr. Subject reads the assignment and is thus prepared to discuss and be tested on the material.

### **Hypothesis 3:**

Mr. Subject lacks confidence in his ability to accomplish certain learning tasks, specifically reading the assigned material and completing the required review questions.

Based on the summary of findings, Mr. Subject needs to be motivated to read the assigned material. He has no particular problem perceiving what is transpiring in the classroom or lab. Mr. Subject's problem is more oriented around a lack of preparation. This, then, is at rock bottom a problem of self-efficacy. By this I mean that Mr. Subject does not put forth the effort to read the assigned material because he does not believe he can read and retain any useful information. This is regardless of any help that is extended. Fundamentally, Mr. Subject is very sure that he cannot do it. Mr. Subject needs to be convinced that time spent reading and understanding theory espoused in the textbook will greatly enhance his understanding of the material, enable him to better participate in the classroom and lab, and allow a deeper, more thorough base of knowledge to successfully complete the required testing. Further, he needs to be convinced that he can do it.

As I stated before, I conduct 5 minute counseling sessions with each student throughout the semester. I conducted a session with Mr. Subject on Thursday, 14 February, 2008.

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In typical fashion, I showed him his student progress report. Mr. Subject's overall current grade was 75% (C). I pointed out that this was a full 6 points above the class average. I also pointed out that his grade would have been much higher, probably 90% or more, but for the fact that he had not completed all of the chapter review questions. I explained that his grades in all areas were as follows:

Chapter Review Questions	65%
Labs/Hand on/ quiz	95%
Tests/Exams	65%

All of these grades, except the review questions, are at least 5 points above the class average. The problem is that you do not complete the review questions. I asked him why this was so. Mr. Subject explained that he did not read the assigned material and therefore could not complete the review questions. I asked why he did not do the reading. He explained that he thought he would have great difficulty reading the assignment and would simply learn nothing from it. I indicated that this was nonsense and he could certainly read the material and understand the theories and ideas involved. We agreed that Mr. Subject would read the assignment, complete the review questions, increase his knowledge and expertise, and, in the end, achieve an A in this Automotive Technology class.

### **Research:**

I still feel that the third hypothesis is valid, that is that Mr. Subject lacks confidence in his ability to accomplish certain learning tasks, specifically reading the assigned material and completing the required review questions. This problem may be generally described as low self-confidence and a lack of appropriate motivation. With these issues in mind, I chose these readings.

- a. "A Motivational Analysis of Academic Life in College" by M.V. Covington, 1977.
- b. "Learning About Learning, Teaching for Effective Learning: How We Learn" published by Learning and Teaching Scotland 2007.
- c. "Tips for Motivation" from Tools for Teaching, by Barbara Gross Davis, 1999.

I will quickly summarize each reading, explore specific application to my student(s), and provide a general overview of classroom relevance.

The first reading, "A Motivational Analysis of Academic Life in College" by M.V. Covington, provided a baseline for ideas, concepts, and measurements of motivating individuals to a higher effort and encouragement of a love of learning.

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This baseline points to a dependency on the individual reason (motive) to learn in the first instance. The reading is broken into two parts that attempt to explore the implications of this proposition.

Part one focuses on *motives-as-drives*, internal needs or states that compel an individual to action. The section reviews what we know about motivation, what factors affect motivation, and how this all effects the larger achievement process. This concept views that motivation exists largely in the individual and acts as an enabling device. This theory then relies heavily on the reward and punishment model albeit in a more subtle and sophisticated form compared to most primary and secondary educational settings.

Part two provides an examination of an alternative metaphor: *motives-as goals*. This theory posits that all actions are given meaning, direction and purpose by goals that the individual seeks out and that quality and behavior will change as these goals change. This encourages motivational change to learn for the sake of learning and seeks to raise motivational levels beyond simply increasing academic achievement. The theory also raises, but does not answer, the question of conflict between individual motivation and situational, circumstantial motivation.

Application to my individual case was long and complex and this made it difficult to “find” my student in all of the heavy smoke. The reading further pointed to the tension between grades as an identifier of class ranking and peer status as opposed to individual motivation to achieve discernable achievement or knowledge as compared to a standard within an industry or discipline.

This may be a moot point if the goals and drives can be reconciled to meet at the point of development of a good knowledge base within a classroom. Simply stated, if the individual can work harder to increase knowledge as a result of increased classroom status and, at the same time, achieve the standard set by the Instructor, the department and the Industry, all drives and goals have been met.

So, with this in mind, we examine and compare Mr. Subject with the format set out in the reading. Self-estimated ability seems to be more of the problem rather than less. Feelings of low ability feed low performance. My estimate of Mr. Subjects’ plot on the Quadripolar graph (p. 64) would place him in the southeast sector. This identifies a failure-accepting modality defined by self-doubt (ability), poor study skills, low anxiety, and little time studying. But the main qualifier is the individual regard for low ability, as this drives all of the rest.

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Fundamentally, if the self-doubt can be assuaged, aptitude becomes secondary to a more general thirst for knowledge and an increased love for learning and investigation. This needs to go hand in hand with the understanding of failure as a motivator but not as a disqualifier. Any assessment of the students' self-reported confidence would be beneficial.

The second reading "Learning About Learning, Teaching for Effective Learning: How We Learn" published by Learning and Teaching Scotland 2007 is a small pamphlet that covers the latest theories involving learning. The chapters include: How we learn, difference, intelligence, potential, the learning brain, emotions and feelings, thinking and understanding, self-motivation, creativity, learning together, ICT, and assessment. Because of my hypothesis, I will be focusing on the self-motivation chapter, pages 45 to 50.

The chapter initially describes intrinsic and extrinsic motivation. These motivations are typically described as "love to learn" and "reward or punishment types. Achievement and success stem from both sorts of motivation. The chapter states that motivation and achievement are closely linked. Lack of achievement is generally the cause of poor motivation, rather than the result of it. The largest modifier for developing student self-motivation is the teacher and the classroom setting.

As to how the reading can help, the chapter on self-motivation was useful. The idea that motivation could be created from achievement is worthwhile and easy to accomplish. A survey constructed to evaluate any sort of accomplishment will do. Even the poorest student should be able to do something right enough for a positive comment and the start of some sort of esteem. In the case of Mr. Subject, I had the class fill out a self-confidence survey on tasks that most students should be able to successfully accomplish. This will be used as a "builder" for future consoling sessions and provide immediate feedback to the student.

The third and final reading "Tips for Motivation" Tools for Teaching, by Barbara Gross Davis, 1999, and provides an overview for motivation and confidence building. The text proclaims general ways teachers can help self-motivate students. Most importantly, the reading points to early, positive feedback that should support the students' belief that they can meet the standard and do well in the course. Also important is the development of realistic expectations of student performance.

Each theme was expanded on and realistic illustrations were used to help the instructor apply the strategies. Of particular interest were the tips on course structure to support self-motivation, feedback that motivates, and ways to motivate students to do the reading and study involved in the class work.

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I was extremely interested in the part that could help motivate students to do the reading assignments. My classes always struggle with the reading and generally do not complete the reading. The paper pointed to several good ideas. These ideas, assign study questions, notes that can be used at exam time, and exam questions that are in the reading but not the lecture indicate a more lucid approach to a high demand class. All of these ideas will be incorporated in my classes at the earliest opportunity.

### **Application:**

I decided to adopt these strategies during the week of 3 to 7 March, 2008. I conducted a 10 minute class meeting on that Monday and outlined the changes to the ensuing classes and, indeed, the rest of the semester. I issued each student ½ sheet of printer paper and instructed the students to compile all relevant notes from the reading and lectures. This set of notes could then be used at the time of the exam, in this case, on Wednesday. I also explained that some exam questions would come from the readings, but would not be a part of the lecture. I stressed that reading, making useful notes, and participating in the lecture should help the student learn more.

Also on this Monday, I assigned the review questions at the end of the lectured and tested chapter with the stipulation that the question were due before the exam on Wednesday and that a student would not get to take the exam until the questions were completed and handed in.

As with most things academic, the students took a couple of iterations to comply. The results are about what I had anticipated. Most students took advantage of the note system, most complete the questions, and even more importantly, students are reading the material. The Monday lectures are much livelier, with questions and interest. I think that the new strategies have improved student motivation and self-confidence levels as well as improving test scores. The student exam average improved 4 points as a result of the changes. I think that once I get all to participate, the improvement in scores could trend upward even more.

On Thursday, I also administered a Self-Confidence Assessment. This assessment had three purposes. First, I needed to discover how confident each student was at completing the listing of common tasks. Secondly, I needed to have each student assess their personal self-ascribed ability to accomplish these tasks. And in the third instance, the student should feel that they can accomplish at least some of the tasks listed and thus feel that they have some level of competency. I think that the results vindicated and validated each purpose very well. I will also use each assessment to persuade each student that they have indeed developed a level of expertise that can be built upon.

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The assessment consisted of sixteen questions about tasks and principles that have been taught through-out the year. The even numbered questions were lab tasks that all students should be able to accomplish. The odd numbered questions were classroom principles that each student should be able to explain.

The students was instructed to read each question and circle a number, one through four with four being the highest confidence, to indicate whether a student could accomplish the task or explain the principle. I scored the assessment by totaling the number of even fours and threes and the number of odd fours and threes to get a composite score and then dividing by eight. This gave me a self-confidence percent to compare among all students surveyed. The scores bore a very close resemblance to what I thought each student was capable of.

There again, I used this assessment to gage self-confidence levels in students that should have scored themselves as all fours. While no student circled all fours, several students circled all threes and fours. I would score these students at their self-identified level of proficiency. Additionally, several students circled all ones and twos and I would tend to agree with those self-assessments. All in all, I thought the survey was easy to assemble, easy to administer, easy to score, and was a very good predictor of a students' self-confidence level.

Mr. Subject also completed the assessment and self-assessed about 85% on lab skills and a little lower on the classroom principles. These self-assessed evaluations of his skill sets were very close to where I would grade him. I counseled him on the critique and asked him why he scored himself lower on the classroom principles. Mr. Subject claimed that he felt intimidated about writing answers regarding classroom instruction and lectures. I asked him if he felt something was lacking in my classroom presentation. He insisted that this was not the case, but that he was perhaps less than fully prepared for most lectures and could work to take better notes. I said this was fine and challenged him to follow his own advice.

As a footnote, the class had a hands-on brake component identification quiz on Friday. Mr. Subject claims to have studied the text and thus achieved a 100% on the quiz. He was proud of his success and I exclaimed that it was an "I told you so" moment. Perhaps we have started down the road to better scholarship through reading and understanding the assigned reading material.

After close consideration and more that a little thought and several classroom assessment surveys and questionnaires, I have identified these modifications to the weekly model.

### **Modified Classroom Model:**

- a. Student reads assigned and associated classroom theory from assigned text.
- b. Student completes review questions at the chapters' end.
- c. Lecture on theory with aids during slide and white board presentation.
- d. Student turns in review questions and takes test.

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e. Student observes, identifies, disassembles, assembles, and seeks to comprehend theories and principles during focused Lab exercises and related assignments and assessments.

f. Student demonstrates knowledge and understanding of theory and principles during periodic hands-on exam.

Additionally, students will continue to receive regular counseling during the semester and continue to self-evaluate using the self-confidence assessment. These modifications should integrate some of the latest motivational theory, provide a more clear and timely indication of where each student is at in any given instruction block, and point to a more coherent rejoinder to on-going learning issues in the classroom.

### **Final Look:**

Mr. Subject received his last five minute counseling on 27 March, 2008. I indicated that he had an 86% overall, with a 78% on the tests and had completed all of the chapter review questions for this block of instruction. I indicated that this was a vast improvement and that he should continue the trend. Mr. Subject still maintained that he had some difficulty with the testing. I stated, quite emphatically, that he most certainly did not. His test scores were up 13 points and the overall grade was up 11 points as well. I told him to keep working toward the A, as this certainly indicated that he was on his way to better grades. Mr. Subject further stated that this was one of his best subjects and one of his highest grades. I complimented him on his work and challenged him to "get the A", as it was certainly within reach. I felt that his self-confidence had been raised and for good reason. Mr. Subject improved during the balance of the rest of the class and certainly earned the A- that was awarded. Mr. Subject had proven to me that he could do the work, but more importantly, he had proven it to himself.

Enclosures:

Initial One Minute Survey

Research paper feedback Survey

Group Instructional Feedback Technique Evaluation

Self-Confidence Assessment

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WELCOME TO COLLEGE

You have enrolled in a one school year class that will provide a comprehensive overview of Theory about Automotive systems, Brakes, Electronics, Applied Industrial Math and related Lab projects.

Please take the time to provide comments and honestly answer these questions.

I took this class because:

I hope to learn about:

I am interested in automotive theory and system repair because:

Upon reflecting and answering these questions, we will introduce ourselves and discuss our interest in Automotive matters.

Initial One Minute Survey



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I would like to take this opportunity to see if we can improve the learning involved during your time spent in the Classroom and the Lab (shop). I would like you to take several minutes to answer these questions:

1. Give one or two specific examples of activities that are done in the Classroom and Lab that are helpful to your learning and understanding.
2. Give one or two specific examples of activities that are done in the Classroom and Lab that are **not** helpful to your learning or understanding.
3. Please list several practical changes that could be implemented to help improve your learning and understanding and add to the relevancy of the classroom instruction.
4. Use the attached blank sheet, assemble into groups, and compare your responses.

Then form and report a consensus.

Group Instructional Feedback Technique Evaluation

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Class \_\_\_\_\_ Date \_\_\_\_\_ Name \_\_\_\_\_

Read the task or principle and accurately and honestly indicate your ability to complete the task or explain the principle.

Task or principle Level of Confidence, 1 = Low thru 4 = High.

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. Describe the properties of brake Fluid.                    | 1 | 2 | 3 | 4 |
| 2. Could you mount and balance a tire?                        | 1 | 2 | 3 | 4 |
| 3. Describe why a modern brake system is split.               | 1 | 2 | 3 | 4 |
| 4. Could you safely hoist a car?                              | 1 | 2 | 3 | 4 |
| 5. Explain the Material Safety Data Sheet Notebook.           | 1 | 2 | 3 | 4 |
| 6. Could you successfully retrieve data from the ShopKey.     | 1 | 2 | 3 | 4 |
| 7. Explain why brake systems rely on the hydraulic principle. | 1 | 2 | 3 | 4 |
| 8. Identify 3 pieces of shop safety equipment.                | 1 | 2 | 3 | 4 |
| 9. Explain why bearings need to be lubricated.                | 1 | 2 | 3 | 4 |
| 10. Could you check a battery with a load tester?             | 1 | 2 | 3 | 4 |
| 11. Describe the engine and its four cycles.                  | 1 | 2 | 3 | 4 |
| 12. Could you cut a rotor with the brake lathe?               | 1 | 2 | 3 | 4 |
| 13. Explain how to dispose of used auto fluids.               | 1 | 2 | 3 | 4 |
| 14. Could you bleed a brake system after a rebuild?           | 1 | 2 | 3 | 4 |
| 15. Describe where exhaust gas from the engine vents to.      | 1 | 2 | 3 | 4 |
| 16. List several tools and there specific purpose.            | 1 | 2 | 3 | 4 |

Self-Confidence Assessment