

## Social Analysis Systems<sup>2</sup> OM

Concepts and Tools for  
Collaborative Research and Social Action

<http://www.sas-pm.com/>

### **Name of this technique: Skill Dynamics**

**Author(s) and correct citation:** Jacques M. Chevalier, ‘SAS<sup>2</sup> 1.0: Skill Dynamics,’ in *Social Analysis Systems<sup>2</sup> 1.0*, <http://www-sas-pm.com/>.

**Acknowledgements:** *Skill Dynamics* is a SAS<sup>2</sup> adaptation and development of input-output analysis, a well-known technique used in economics and economic policy and planning throughout the world for the past half-century.

### **What is the goal of Skill Dynamics?**

*Skill Dynamics* helps you assess the degree to which each skill you apply to a set of activities contributes to other skills and depends on them at the same time.

### **What are the guiding principles for this technique?**

- When you use certain skills in a set of activities, it is important that you keep in mind the dynamic interaction between your skills — the degree to which each contributes to and depends on other skills.
- Improving or making better use of a skill that contributes and depends on other skills may have a **chain effect** on all the dependent skills and have an influence on the initial skill itself.

### **Here’s how to use Skill Dynamics**

#### *Creating a table*

1. Identify a set of **activities** where you need to use *Skill Dynamics*. Clarify the purpose of your analysis.

2. Make a list of the **skills** that you're currently using in your activities. Write (or draw) each skill on two separate cards. See example in Step 9.

The skills should be concrete and clearly defined. If the skills are too general, use the *Laddering Down* technique to make them more meaningful and detailed. Ask 'What do you mean by this?' or 'Can you give an example of this?' You can also use description and storytelling to explore your topic area (such as describing the history of a poverty reduction project), and then use this information to identify the skills.

3. Create a **table**. Place one set of skill cards in the top row. Then place the other set of cards (showing the same skills) in the first column. See example in Step 9.
4. Establish a **rating scale** for the levels of contribution that each skill makes to other skills. The scale could have values from 0 to 10, for instance.

If you want this exercise to be more precise, identify **indicators** (using simple statements or drawings) that define the meaning of each number on the scale. For instance, you may create a scale of 0 to 4 where 0 means that one skill makes no contribution to another; 1 means that one skill you have helps you use another but is not really necessary; 2 means that you need to have one skill in order to use another but the way you use one skill will not affect the way you use the other skill; 3 means that the way you use one skill has some impact on the way you use another; 4 means that using one skill well increases your chances of using another skill equally well.

Test your scale with the group to make sure that the exercise, the scale, and the indicators are clear to everyone.

5. Discuss the **level of contribution** that each skill makes to all other skills. Ask the question 'At what level does this (name the row skill) contribute to that (name the column skill)?' or 'How important is this (name the row skill) for that (name the column skill)?' Clarify the question if necessary.

When scoring each skill use the scale and the indicators you created in Step 4. You can give the same score to two or several skills. Record each score on its own card. To help you interpret the results of this exercise, write the reason given for each score on the reverse side of its card. Place the resulting **score cards** in the appropriate rows and columns. See example in Step 9.

If you prefer to focus less attention on the table, use a **flipchart to represent each column skill**. On each flipchart describe the skill. Then, place the cards that describe and rate the contribution other skills make to the flipchart skill. Once the flipcharts are completed, use the table created in Step 3 to compile the scores.

Don't use **averages** when people have disagreements about scores. Instead discuss the issue until you reach an agreement based on consensus or a majority vote.

Don't insert scores in the squares that **combine a skill with itself** ('Training' by 'Training' for instance). Leave these squares or cells empty (see example in Step 9).

If you don't want to use written numbers when rating the skills, use simple **phrases** first (see Step 4) and then convert the phrases into measurable objects (from 0 to 4 twigs, stones, noodles or seeds, for instance). Another option is to score each skill with the help of 5 cards colored white (value 0), light grey (value 1), medium grey (value 2), dark grey (value 3), and black (value 4).

Rate the skills column by column. When asked how Skill A contributes to Skill B, participants may invert the question and indicate how B contributes to A. If this happens, you can insert the score in the B-A cell or square and then come back to your initial question about A's contribution to B.

If you want to do the ratings in a short time, place the most important skills in the first rows and the first columns (in the top left) of your table and rate them first. Or you can group the skills, name each group, and then rate the groups instead of the skills. You can also reduce the number of skills by eliminating those that are less important. Another option is to divide all participants into smaller groups, and then ask each group to choose one or a few columns and do the corresponding ratings. Use this option only if the participants don't need to be involved in all the ratings.

You may divide each cell or square into two parts and insert a score in each part: the first score to describe the **actual** contribution that a skill makes to another, and the second score to describe the **ideal** contribution it should make. This way you can use the table to compare the current level of interaction between the skills you're using in a set of activities with the level that you're aiming for in the future.

6. Calculate how each skill contributes to other skills. To calculate this **total contribution** for each row, total all scores in each row and write the result on a card. Indicate on the same card the maximum total (in parentheses) and the average score for each row (the total score divided by the number of column scores). Create a last column to the right and insert the **total and average score** card for each row. Write Total Contribution at the top of the column. See example in Step 9.

7. **dependence** for each column, total all scores in each column and write the result on a card. Indicate on the same card the maximum total (in parentheses) and the average score for each column (the total score divided by the number of row scores). Create a last row at the bottom and insert the **total and average score** card for each column. Write Total Dependence at the bottom of the first column. See example in Step 9.
8. To calculate the **dynamic interaction** between all skills, total all contribution scores you inserted in the *last column* and divide the result by the sum of total maximum scores. To verify these calculations, total all dependence scores you inserted in the *last row* and divide the result by the sum of total maximum scores. This should give you the same percentage figure. Insert the resulting figure at the bottom of the last column.
9. Identify the **scores that contradict** the main tendencies of your table. To do this, compare each score with the average row score to see if they are on the same lower side or upper side of the middle point of your scale (5 in a scale of 0 to 10, for instance). If the score is *not* on the same side as the average row score, compare the score with the average column score to see if they are on the same lower side or upper side of the middle point of your scale. If the score is *not* on the same side again, draw a circle around the score. For instance, in the following table the score for the contribution Calculate how much each skill depends on all other skills. To calculate this **total** of visual design to analysis (6) is on the upper side of the middle point (5); this contradicts the average row score (4.2) as well as the average column score (4.3), which are on the lower side of the middle point.

Here's an example of a *Skill Dynamics* table involving seven project skills and a scale ranging from 0 to 10:

Skills	Analysis	Training	Languages	Networking	Visual design	Theory	Writing	Total contribution
Analysis	X	8	2	0	7	9	8	<b>34 (60)</b> 5.7
Training	5	X	4	8	5	6	9	<b>37 (60)</b> 6.2
Languages	1	9	X	⑨	1	2	8	<b>30 (60)</b> 5.0
Networking	0	4	3	X	0	0	0	<b>7 (60)</b> 1.2
Visual design	⑥	9	0	0	X	4	6	<b>25 (60)</b> 4.2
Theory	⑦	5	0	2	4	X	7	<b>25 (60)</b> 4.2
Writing	7	6	7	3	1	7	X	<b>31 (60)</b> 5.2
Total dependence	<b>26 (60)</b> 4.3	<b>41 (60)</b> 6.8	<b>16 (60)</b> 2.7	<b>22 (60)</b> 3.7	<b>18 (60)</b> 3.0	<b>28 (60)</b> 4.7	<b>38 (60)</b> 6.3	<b>189 (420)</b> <b>45%</b>

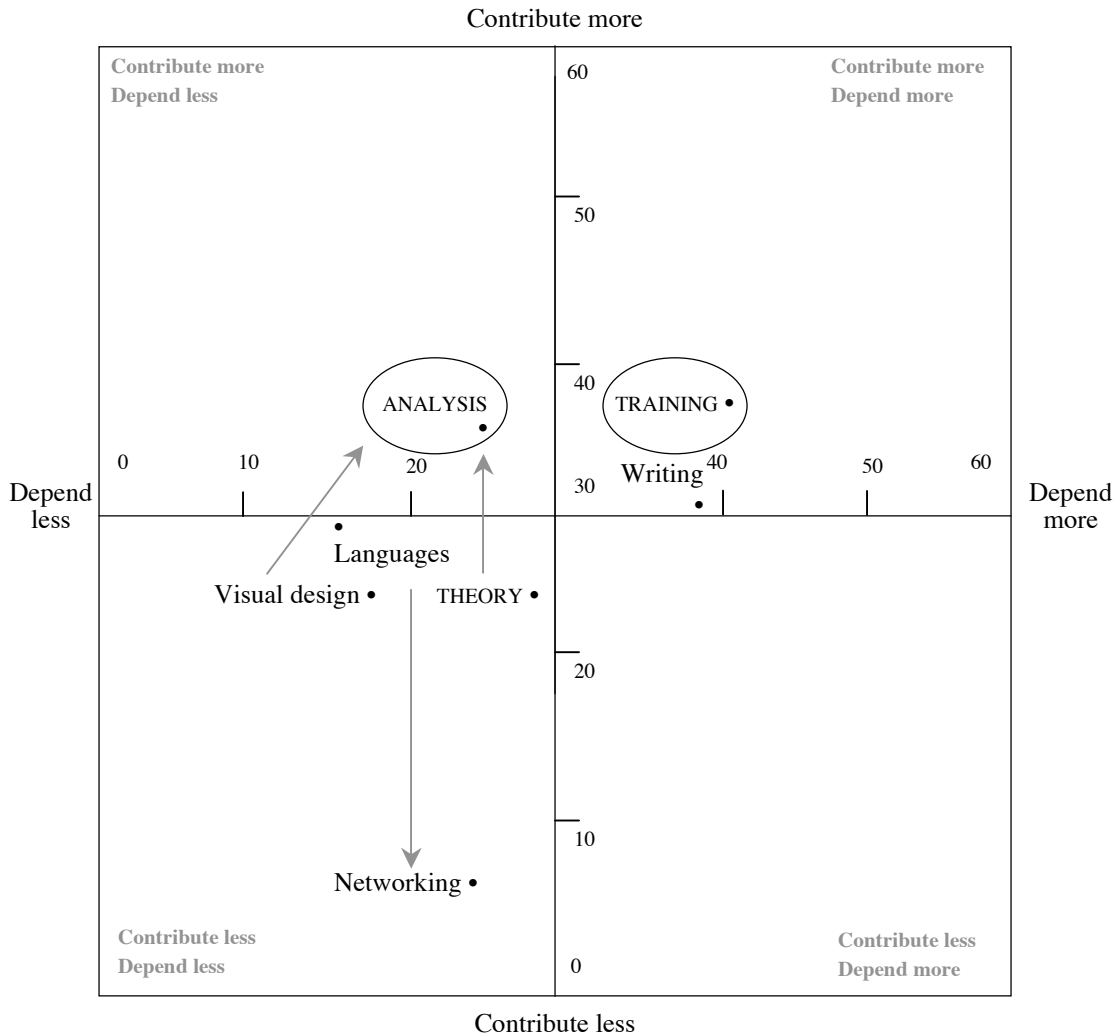
10. Create a **diagram** by drawing a vertical line that crosses a horizontal line. This creates a cross within a square. Write the project or program name (identified in Step 1) above the diagram using key words or a drawing. See example in Step 16.
11. Write the number that represents your **middle score** where the lines cross. To calculate the middle score, total the maximum scores in a row and divide the result by two. In the table shown in Step 9, the total maximum row score is 60; the middle score is therefore 30. See example in Step 16.
12. Write the minimum and the maximum total scores (0 and 60 in the table shown in Step 9) at opposite ends of the vertical and horizontal lines. Use the **vertical line** to represent

the total contribution of each skill (using the last column scores from your table in Step 9). Use the **horizontal line** to represent the total dependence of each skill (using the last row scores from your table in Step 9). See example in Step 16.

13. In each corner of the diagram, write (or draw) the **type of skill** that you obtain when you combine the possible outcomes. This gives you four types of skills: those that contribute and depend more (top right); those that contribute more and depend less (top left); those that contribute less and depend more (bottom right); those that contribute and depend less (bottom left). See example in Step 16.
14. To place each skill in the diagram, mark where the skill is located on both the vertical line (using its score for total contribution) and the horizontal line (using its score for total dependence). Draw a line from each location and use a dot to mark the place where the two lines intersect.
15. Use arrows to indicate relationships that **contradict the main tendencies** of your diagram. To identify these relationships, use the scores encircled in Step 9. Use **continuous arrows** for scores above the middle point of your scale, and **broken arrows** for scores below the middle point. The continuous arrows indicate bottom-side skills that contribute to skills located on the left side of your diagram. The broken arrows indicate upper-side skills that do *not* contribute to skills located on the right side of your diagram. See example in Step 16.
16. You may include in the diagram **other information** that you find useful for this analysis, such as your current level of skill or your level of satisfaction in using each skill. Use your own **code** (such as capital letters, colors or circles) to identify these characteristics. For example, use capital letters to identify your strongest skills, and draw circles around skills that you find more satisfying.

Here's an example of a *Skill Dynamics* diagram using the scores from the table shown in Step 9:

**Project:** Designing and implementing a training program



**Summary of this example:** Training and analysis are the strongest skills (in capital letters) used in this project. They create the highest levels of satisfaction (in circles). Together with writing they contribute the most to other skills. Skills in theory and visual design are helpful when doing analysis, and languages are helpful when doing networking. By contrast, networking skills contribute little to other skills.

*Interpreting the results*

17. To interpret your *Skill Dynamics* analysis, start with a **review** of the **process** itself, including the way that participants interacted and reached decisions at each step of the process. You can also review the **substance** of the exercise, including the topic that participants selected, their purpose in doing the exercise, the skills they identified, the

kind of information or knowledge they used to rate the skills, the contradictions and information added in Steps 15 and 16, etc. Summarize all the main points of your review.

18. To facilitate the interpretation of your results, find a symbol or a concept that characterizes each corner of the cross-shaped diagram (see Step 16). For instance, in *Sinfonie* (Heussen and Jung), the elements in the bottom left would be called ‘sluggish,’ those in the bottom right would be called ‘passive,’ those in the top left would be called ‘active,’ and those in the top right would be called ‘critical.’

19. Assess the overall level of interaction of your skills. A *Skill Dynamics* analysis can produce three possible results: integration, hierarchy or fragmentation. You know there is **integration** when you have many skills in the top-right section of your diagram. This gives you a high interaction score, usually above 60% (calculated in Step 8). Keep in mind that applying more of a top-right skill may have a **chain effect** on the way you apply all dependent skills and have a positive influence on the initial skill itself.

You know there is **hierarchy** when your diagram consists mostly of top-left skills that contribute to bottom-right skills. This gives you a middle interaction score, usually between 40% and 60% (calculated in Step 8).

You know there is **fragmentation** when you have many skills in the bottom-left section of your diagram. This gives you a low interaction score, usually below 40% (calculated in Step 8). Fragmentation means that applying more of one skill will not contribute to a better use of other skills.

20. Discuss how you can improve some of your skills or make use of them in ways that **better contribute** to other project or program skills. Keep in mind the contradictions and the information added in Steps 15 and 16 (such as the skills you find less satisfying). Once you have plans to improve or make better use of some skills (for instance, making better use of Theory in the training program described in the example given in Step 16), you may modify the row and column scores for these skills and recalculate the overall interaction of all skills (see Step 8).

## **Making this process work for you**

### *For simpler versions*

- Work with one or two people or with small groups of people who have many common characteristics.
- Use no more than 4 skills. Reduce the number of skills by eliminating some or through the *Freelisting* technique.
- Use drawings or pictures to represent each skill.
- Rate the skills with a simple scale (using scores from 0 to 3, or simple phrases).
- Don't use indicators to define the levels of contribution.
- Don't identify relationships that contradict the main tendencies of your table and diagram, and don't use other codes to insert other kinds of information in your diagram (Steps 9, 15 and 16).
- Use a flipchart to represent each skill and to describe and rate the contributions other skills make to the flipchart skill (see Step 5). Then, rethink how some skills may better contribute to other skills. Don't do the calculations and the analysis described in Steps 6 to 20.

### *For more advanced versions*

- Take more time to gather the information you need to complete the exercise.
- During the exercise, discuss and record the views that participants express.
- Work with a greater number of people or groups.
- Use more than 4 skills.
- Identify criteria to justify each rating exercise. Write a description for each indicator and each contribution score.

- Use surveys to find out how people characterize and rate the relationships between skills in a topic area.
- Add more information in Step 16.
- Use RepGrid (<http://repgrid.com/SAS/>) to create your cross-shaped diagram (Step 16).
- Use *Problem Domain* to produce a detailed description of all skills.

### **Readings and links**

Leontief, Wassily W., Input-Output Economics. 2nd ed., New York: Oxford University Press, 1986.

Heussen, Hejo and Dirk Jung, SINFONIE, <http://www.denkmodell.de>

Krumme, Günter, Economic & Business, 'Analysis of Interdependence Structures: Input-Output,' University of Washington, Seattle,  
<http://faculty.washington.edu/~krumme/207/inputoutput.html#ionet>

Evaluation of socio-Economic Development – The Guide, Methods & Techniques  
Analysing Information, Input/Output Analysis,  
[http://www.evaled.info/frame\\_techniques\\_part3.asp](http://www.evaled.info/frame_techniques_part3.asp)

## Summary of procedures

- (1) Identify a set of **activities** and the **skills** currently used in these activities. If the skills are too general, ask ‘What do you mean by this?’ or ‘Can you give an example of this?’ Write (or draw) each skill on two separate cards.
- (2) Create a **table**. Place one set of skill cards in the top row. Then place the other set of cards (showing the same skills) in the first column.
- (3) Establish a **rating scale** (from 0 to 10, for example) for the levels of contribution that each skill makes to other skills. If you want this exercise to be more precise, identify **indicators** (using simple statements or drawings) that define the meaning of each number on the scale.
- (4) Use your scale to rate the **level of contribution** that each skill makes to all other skills. Ask the question ‘At what level does this (name the row skill) contribute to that (name the column skill)?’ Record each score on its own card. Place the resulting score cards in the appropriate rows and columns. To help you interpret the results of this exercise, write the reason given for each score on the reverse side of its card.

To focus less attention on the table, use a **flipchart to represent each column skill**. On each flipchart describe the skill. Then, place the cards that describe and rate the contributions other skills make to the flipchart skill. Once the flipcharts are completed, use the table created in Step 2 to compile the scores.

Don’t use **averages** when people disagree about scores. Don’t insert scores in the squares that **combine a skill with itself** (‘Training’ by ‘Training’ for instance). You may divide each cell or square into two parts and insert a score in each part: the first score to describe the **actual** contribution that a skill makes to another, and the second score to describe the **ideal** contribution it should make. If you want to do the ratings in a short time using many skills, divide all participants into smaller groups. Then, ask each group to choose one or a few columns and do the corresponding ratings.

- (5) Calculate how each skill contributes to all other skills. To calculate this **total contribution**, total all scores in each row and write the result on a card. Indicate on the same card the maximum total (in parentheses) and the average score for each row.

Create a last column to the right and insert the total and average score card for each row. Write Total Contribution at the top of the column.

- (6) Calculate how much each skill depends on all other skills. To calculate this **total dependence**, total all scores in each column and write the result on a card. Indicate on the same card the maximum total (in parentheses) and the average score for each column. Create a last row at the bottom and insert the total and average score card for each column. Write Total Dependence at the bottom of the first column.
- (7) To calculate the **dynamic interaction** between all skills, total all contribution scores you inserted in the *last column* and divide the result by the sum of total maximum scores.
- (8) Identify the **scores that contradict** the main tendencies of your table. To do this, compare each score with the average row score to see if they are on the same lower side or upper side of the middle point of your scale (5 in a scale of 0 to 10, for instance). If the score is *not* on the same side as the average row score, compare the score with the average column score to see if they are on the same side of the middle point of your scale. If the score is *not* on the same side again, draw a circle around the score.
- (9) Create a **diagram** by drawing a vertical line that crosses a horizontal line. Write the number that represents your middle score (the sum of maximum scores in a row divided by two) where the lines cross. Write the minimum and the maximum total scores at opposite ends of the vertical and horizontal lines.
- (10) In each corner of the diagram, write (or draw) one of the following **type of skill**: those that contribute and depend more (top right); those that contribute more and depend less (top left); those that contribute less and depend more (bottom right); those that contribute and depend less (bottom left).
- (11) To place each skill in the diagram, mark where the skill is located on both the vertical line (using its score for total contribution) and the horizontal line (using its score for

total dependence). Draw a line from each location and use a dot to mark the place where the two lines intersect.

- (12) Insert arrows to indicate relationships that **contradict the main tendencies** of your diagram. To identify these relationships, use the scores marked encircled in Step 8. Use continuous arrows for scores above the middle point of your scale, and broken arrows for scores below the middle point.
- (13) Include in the diagram other useful **information**, such as your current level of skill or your level of satisfaction in using each skill. Use your own **code** (such as capital letters, colors or circles) to identify these characteristics.
- (14) To interpret your *Skill Dynamics* analysis, start with a **review** of the **process** itself, including the way that participants interacted and reached decisions at each step of the process. You can also review the **substance** of the exercise, including the topic that participants selected, their purpose in doing the exercise, the skills they identified, the kind of information or knowledge they used to rate the skills, the contradictions and the information added in Steps 12 and 13, etc. Summarize all the main points of your review.
- (15) Assess the overall level of interaction of your skills based on their distribution in your diagram as well as the contradictions and the information added in Steps 12 and 13. A *Skill Dynamics* analysis can produce three possible results: integration, hierarchy or fragmentation. **Integration** happens when you have many skills in the top-right section of your diagram (this gives you an interaction score above 60%). **Hierarchy** is when your diagram consists mostly of top-left skills that contribute to bottom-right skills (this gives you an interaction score between 40% and 60%). **Fragmentation** happens when you have many skills in the bottom-left section of your diagram (this gives you an interaction score below 40%). Fragmentation means that applying more of one skill will not contribute to a better use of other skills.
- (16) Discuss how you can improve some of your skills or make use of them in ways that **better contribute** to other project or program skills. Keep in mind that improving or

making better use of a 'top right' skill located in the top right of your diagram may have a *chain effect* on all other dependent skills and have a positive influence on the initial skill itself. Once you have plans to improve or make better use of some skills, you may modify the row and column scores for these skills and recalculate the overall interaction of all skills.

## **Illustrations**

Forthcoming.