

Learn by Doing!

An alternate skill system for Star Frontiers

The Star Frontiers skill system has taken its fair share of knocks over the years. It's arbitrary and limited so there have been several systems replacing it. This is another. Learn by Doing lets characters improve their skills in an organic fashion: the skills that improve are the ones you use.

The Summary

Instead of a PSA, a beginning character picks two skills to be trained in, and one more to be his favored skill. All other skills are untrained. Learn by doing skills do not have separate levels, instead your raw percentage based on your ability score and experience is your skill level. So you might have Pistol skill 45% and Computers skill 80%.

Using a skill during an adventure grants the character an improvement roll for that skill. If the improvement roll succeeds, the skill rises – 1d5% for untrained skills and 2d5% for trained and favored skills. Favored skills rise by 1% even if the improvement roll fails. You can improve every single skill you use once each adventure.

The improvement roll is based on your chance of skill failure. So you have a 55% chance to improve a skill of 45%. Improvement rolls may also be made for ability scores in the same fashion. An ability rises by 1d5% when improved.

The Mechanics

Learn by Doing! Skills

Learn by Doing uses 45 skills arranged into 6 skill areas. A character can be trained or untrained in each skill, affecting his chances of success using it and the ease with which it improves. Certain skills are specialist skills. They can not be used at all unless they are trained. Other skills have prerequisites you must have before you can become trained. If a prerequisite has a percentage listed, you must have at least the same percentage chance of success in the prerequisite skill in order to become trained in the new skill.

Each skill's initial percentage is set by the ability listed after the skill's name in the skill list and may be improved by use. Certain races may have unique skills, like the Dralosite ability to detect lies. These skills are used and improved like other skills but may only be acquired by having the correct species.

Skill Acquisition

When creating a new character, pick one skill to be a favored skill and two skills to be trained. You are untrained in all other skills. Your initial skill level in untrained skills is 1/2 the ability score, rounded down. Trained and favored skills gain a 10% bonus to the untrained skill level. In addition, you receive one more choice depending on your species:

- Dralosites gain Lie Detection as a trained skill.
- Humans may pick a second favored skill of their choice.
- Vrusk gain Comprehension as a trained skill.
- Yazirians gain Battle Rage and Glide as trained skills.

Example: Mark is creating Groob the Dralosite. Groob is a mechanic who's solution to every problem is a wrench. Mark chooses Repair(Log) as Groob's favored skill. Since Groob has a Logic of 60, his initial skill level is $1/2(60)+10$, or 40%. Mark gives Groob the Robotics(Log) and Melee Weapons(Str) skills. Robotics starts out at the same level as Repair, 40%, while Groob's 55 Strength means his initial Melee skill is $1/2(55)+10$, 37%. Mark also notes that Groob has the Lie

Detection skill at 15%.

Using Skills

To use a skill, roll percentile dice. If the result is less than or equal to the character's skill level, the check succeeds. A result of 01-05 is a critical success while a result of 96-00 is a critical failure. Critical results may have special effects with some skills and situations. The referee may determine that it is not possible to have a critical result for a particular roll.

Modifiers may apply to the roll when the referee so rules. Common modifiers are listed below.

Difficulty	Range	Modifier
Trivial	-	+40
Easy	-	+20
Average	Point Blank	+0
Tough	Short	-10
Challenging	Medium	-20
Difficult	Long	-40
Extreme	Extreme	-80

Movement

(Most movement modifiers except stationary can apply to both skill user/attacker or target)

Stationary (target only)	+10
Walking	+0
Running/target in a moving vehicle	-10
Dodging/Defending/target in a moving vehicle over 150m/s	-20
Animal running with a speed of Fast	-20
Animal running very fast	-30

Misc Modifiers

Using more than one weapon/Making more than one skill check	-10 per additional weapon/check
Improvised weapon/tool	-10
Using the wrong hand	-10
Target prone at range	-5
Light Cover/Concealment	-10
Attacker/User dazzled by light	-15
Heavy Cover	-20
Attacker/User wounded/encumbered	-10
Target Helpless/Unaware	+20

Some modifiers will not apply to certain checks. The referee will decide what to apply to any check.

Improving Characters

Experience Points

When using Learn by Doing, it is not necessary to award characters experience points. If a character uses a skill in a way that drives the adventure forward, he has a chance to improve that skill at the end of the adventure. Likewise, if a character attempts an ability check during an adventure, he has a chance to improve that ability.

If the character faces no danger when using an ability or skill, or if there is no chance of failure, then the character should not be allowed to improve that skill based on that use. However, a referee might allow a credit towards training time.

Improving Abilities

At the end of each adventure, the player may attempt to improve one ability that the character attempted an ability check during the adventure. Percentile dice are rolled and if the result is greater than the current value for the ability or if the roll is greater than 95 in any case, roll 1d5 and add the result to the ability's value. Only one ability may be improved this way each adventure and no ability can rise above 100 this way.

When your ability scores improve, all of your skills based on those scores improve as well.

Improving Skills

At the end of each adventure, the player may attempt to improve each skill used that adventure, including any special racial skills. Percentile dice are rolled and if the result is greater than the current value for the skill or if the roll is greater than 95 in any case, the ability improves. If the character is untrained in the skill, roll 1d5 and add the result to the skill level. If the character is trained in the skill, roll 2d5 and add the result to the skill level.

If the number on the percentile dice is less than or equal to the character's skill level, the character was not sufficiently challenged to gain new insights and the skill level remains the same. If the skill is favored, it still increases by one as the character's natural talent shines through. On a roll of 01-02, the character finds himself baffled about how to improve his skill and must receive a number of training units equal to his current skill level before he can attempt to improve the skill again.

Any number of skills may be improved, provided each one was used in a meaningful way during the adventure. No skill may rise above 100 in this manner. Note that specialist skills that the character is not trained in may not be improved in this way as they cannot be used during an adventure.

Gaining New Skills

A character may gain new skills through training of various types. It takes 100 units of training and the character must pass an ability check using the ability listed after the skill name. If the ability check is successful, the character gains the skill as a new trained skill. If the check fails, the training is wasted and must be repeated. A character can only train one skill at a time and generally only one per adventure.

Type of Training	Unit Gain Rate	Cost per Unit
Hypnotraining	10/hr	20 cr
Teacher	1/hr	13 cr
Self-study	1/day	5 cr

Hypnotraining: A combination of drugs, psychology, and virtual reality allow many skills to be learned in a single day. A character may use hypnotraining even while asleep.

Teacher: NPC teachers generally charge the listed rates. A PC may teach if his skill is 20 points higher than his student. Time spent teaching students can count as self-study for the teacher.

Self-Study: Hitting the books/net. Specialist skills may not be learned by self-study but a specialist skill you are trained in may be improved.

Gaining Favored Skills

Certain character options grant additional favored skills. Other than that, gaining them is at the referee's option, usually as a reward for exceptional play.

Improving Skills with Training

A character can use training to improve a skill he already knows. This takes 100 units of training. At the end of the adventure in which training was complete, make an improvement roll just as if the character had used the skill during the adventure. You may not make more than one improvement roll per skill on the same adventure and you may only participate in one type of training at a time.

This rule is intended to allow characters to improve the skills they care about even when the adventure allows them little opportunity to use them. For example, a soldier on a diplomatic mission might spend time on the range to improve his pistol skill or an explorer might sneak off in his free time and map the grounds of a military base. In cases like this, it isn't the number of training units that's important as it is allowing the player to feel like he's playing his character his way. And of course, characters off training are in an excellent position for plot hooks, clues, and the occasional ambush!

Dealing with NPCs

Since NPCs appear only once or twice, they do not generally need to improve their skills. NPCs that accompany the players, like level 6 robots or long term hired guns, can use the same rules as PCs. It's best to restrict the number of skills NPCs improve to one or two trained skills and 3-4 untrained skills.

Published Alpha Dawn NPCs can have their skill levels calculated as normal. Zebulon's Guide NPCs can be converted by giving them a skill level of $\frac{1}{2}$ the relevant ability score plus 8% per ZG skill level. If you need an Alpha Dawn or Zebulon's Guide skill level equivalent for a Learn by Doing skill, use the following table:

Learn by Doing skill level	Alpha Dawn Skill Level	Zebulon's Guide Skill level
Up to 45	1	1
46-50	2	2
51-55	2	3
56-60	3	4
61-65	3	5
66-70	4	6
71-75	4	7
76-80	5	8
81-85	5	9 (Only possible with column shifts)
86-90	6	10
91-100	6	+X

The Skill list

While Learn by Doing will work with almost any substantial skill list, the following list is a decent start. Feel free to add or change any skill as you see fit. Many skills, particularly weapon skills, are grouped in ways very different from standard Star Frontiers. This represents only the personal preference of the author. If you prefer to have a Beam Weapons skill, for instance, Learn by Doing will continue to work exactly the same.

Military

- **Pistols(RS)**
One handed ranged weapons including small crossbows.
- **Rifles(Dex)**
Ranged weapons that require two hands to use including bows.
- **Martial Arts(Str)**
Various forms of unarmed combat. Does not cover claws quills or other natural weapons which are their own skills.
- **Melee Weapons(Str)**
Anything that is held in hand or appendage and used to beat, stab, cut, or otherwise attack others.
- **Thrown Weapons(Dex)**
Muscle powered ranged weapons like spears and knives.
- **Demolitions(Log)** Specialist Skill
Arming, placing, and disarming explosives.
- **Heavy Weapons(Int)** Req Rifles 40%
Anything man portable but large enough that it can't be effectively used while walking.

Technical

- **Computers(Log)** Specialist Skill
Used for hacking, writing programs for computers and robots, and using computers in ways the owners did not intend.
- **Robotics(Log)** Specialist Skill
Allows the design, manipulation, and command of robots.
- **Repair(Log)**
Repair, construction, and usage of anything not covered by another skill.
- **Driver(RS)**
Ground and hover vehicles.
- **Pilot(Dex)** Specialist Skill
Aircars, jetcopters, aircraft, aerospace vehicles.

Social

- **Detective(Int)**
Finding information, interrogation, searching areas for people, things, or clues.

- **Persuasion(Per)**
Convincing people to do what you want.
- **Hypnosis(Per)** Req Persuasion, Specialist Skill
Hypnosis can implant suggestions, suppress pain, and possibly other abilities.
- **Medicine(Log)** Specialist Skill
Medicine is used for surgery, curing and diagnosing ailments of all sorts as well as installing implants or cybernetic limbs.
- **Psychiatry(Ldr)** Req Persuasion 30%, Specialist Skill

Exploration

- **Athletics(Str)**
Climbing, running, jumping, evasion
- **Survival(Sta)**
- **Orientation(Int)**
Finding your way on planets using no equipment
- **Biology(Int)**
- **Botany(Int)**
- **First Aid(Int)**
Stabilize, use simple drugs, bandage wounds
- **Archeology(Log)**
- **Chemistry(Log)**
- **Geology(Log)**

Espionage

- **Stealth(Dex)**
- **Signals Intelligence(Int)**
Operating communications equipment, breaking encryption, finding and eavesdropping on conversations.
- **Electronic Warfare(Log)** Req Sig Int
Operating WNB, cloaks, similar equipment
- **Disguise(Per)**
- **Thievery(Dex)**
Classic thief skills. Picking pockets, opening locks

Spaceship Skills

- **Space Direct Fire Weapons(Dex)** Req Heavy Weapons 50%
Lasers, rockets and other point and shoot weapons on starships
- **Space Guided Weapons(Int)** Req Heavy Weapons 50%, Computers 50%
Missiles and torpedoes
- **Industrial Operation(Ldr)** Req Persuasion, Repair 30%
Running large scale operations like mining, spaceship construction, farming ships
- **Spaceship Engineer(Log)** Req Repair 50%, Computers 40%
- **Spaceship Pilot(Int)** Req Pilot 50%, Computers 50%
- **Astrogation(Log)** Req Computers 60%

Racial Skills

Unless otherwise noted, no changes in mechanics from the Alpha Dawn rules are made. When a racial skill becomes trained or favored, it does not gain the 10% bonus that normal skills do but it does gain the faster rate of improvement, including a favored skill's improvement on a failure.

- **Battle Rage(10%)**
- **Comprehension(15%)**
- **Gliding(Dex)**
- **Lie Detection(15%)**

Natural Weapon skills: A species with one or more natural weapons gains a skill for each type of weapon that they have, so a race with bite and claw attacks would gain a bite skill and a claw skill. Even if the natural weapon acts like another type of weapon, for example the Mechanon's built-in electostunner, they use the natural weapon skills for attacks.

Movement skills: Some species have unusual movement speeds or methods. The species will gain a skill that allows them to do extraordinary maneuvers and recover from problems and critical hits that would otherwise cause them problems. For example, a yazirian would roll against his glide skill to parachute straight down, glide farther than normal, or when hit by a sonic

devastator. There are optional rules that change how far a character can glide in the optional rules section.

This is a list of those special abilities possessed by species printed in the StarFrontiersMan magazine #1-16 that should be adjusted to fit Learn by Doing:

- Alereen: Computers Skill Bonus – Computers(Log) as a favored skill.
- Arborean: Comprehension(15%) and Glide(Dex) as trained skills.
- Boon'sheh: Danger Sense(10%) as a trained skill.
- Bora-Kai: Durability(5) as an untrained skill.
- Eorna: Mentalism-Hypnosis(Per) as a trained skill.
- Fraal: Sense Thoughts(10%) as a favored skill.
- Gorlian: Track(40%) as a favored skill.
- Kurabanda: Mental Shield(10%) and Climb(Dex) as trained skills.
- Mechanon: Claws(Str),Tail(Dex), Internal Electrostunner(Dex), Control Robots(10%) as untrained skills for appropriate types.
- Saurians: Caution(15%) and Detection(15%) as trained skills.
- Skree: Alien Lore- Archaeology as a trained skill.
- Sesheyen: Flight(Dex) as a trained skill.
- T'sa: Juryrig-Repair(Log) as a favored skill.
- Weren: Claws(Str) as a trained skill.

In general, any ability that is improved by spending experience can be changed over. If the ability uses a non-percentile scale, a bit more thought may be needed:

- Determine how many discrete levels of ability the skill has. Using Star Frontier Remastered's Polyplate skill as an example, the skill has two levels: penalty with full polyplate and penalty with no polyplate.
- Decide how many points each level requires. These need not, and should not, add up to 100. Polyplate skill seems like something that a character would pick up fairly quickly so this skill requires 8 points per level, only 16.
- Pick an ability score to control advancement. Stamina seems to be appropriate for Polyplate.
- A character who wears polyplate for a significant time during an adventure can make an improvement roll of ½ his Stamina. If the roll is successful, the character gains 1d5 points towards the next level of Polyplate skill.

Nothing stops a character from making Polyplate skill trained or focused but this skill tops out much quicker than other skills. Characters who make Polyplate a trained skill should receive the first level for free.

Optional Rules

Altering Ability Checks

Normally in Star Frontiers, an ability check is successful if the percentile roll is less than the full value of the ability. Since skills have a base level of half the associated ability, it's better to make an ability check than use a skill in most situations. There are a few ways of handling this.

- Don't allow ability checks and skills to overlap. Skill checks are used for things characters do, ability checks are used for things that happen to characters. Be sure to use positive modifiers when characters try to do easy tasks.
- Put ability checks on the same ½ ability scale as skills. This will make weapons that provoke ability checks more powerful. You may want to allow a second save the next turn before the weapon takes full effect. For example, weapons that cause unconsciousness like the needler and sleep grenades might stagger a person who fails the first save (-20 to all actions, half movement) and cause unconsciousness on the second failed save. If you use this variant, allow characters to improve their ability checks in the same way as other skills.

Background Skills

Background skills are those that have little game applicability but that flesh out a character's background. Occasionally, a background skill might come in handy. For example, Pan-Galactic Corp conspiracy theories could provide leads on who to ask when investigating PGC secrets. A character may begin trained in up to four background skills and may gain new ones for 50 units of training (self study works). Example background skills include:

Painter (Dex)	Football (Str)	Zero gee ping pong (Dex)
Singer (Per)	Yazirian religious customs (Log)	Amateur role playing game designer (Sta)

Chef (Log)	Schools of philosophy (Log)	Sailor (Int)
Artist (Per)	Vrusk history (Int)	Acoustics (Log)

A good source of background skills is Zebulon's Guide. Players should suggest background skills that make sense to them but these skills should never overrule standard skills.

Gliding

A character who has an inherent means to glide gains the glide skill as listed in their species description. Other characters may acquire it as usual by training with a glijet, paraglider, or other device. With a successful glide check a character can do things like but not limited to the following:

- Parachuting straight down, riding an updraft, flying through a small window.
- Keep gliding after failing a reaction speed check against an explosive or a critical hit.
- Gliding farther. With a successful gliding check, a character can glide 2 additional meters forward for each meter dropped, 4 on a critical success. On a failure, you still glide your normal distance unless you critically fail, in which case you begin to fall.
- Making a flying tackle. The character hits with a successful glide check and inflicts his unarmed damage or one held melee weapons damage plus an additional 1d10 per 10 meters horizontal the character moved this round.

A character on a 1g world with a normal atmosphere will lose 10 meters of altitude per round and normally can glide 1 meter forward for each meter dropped. A heavy atmosphere will cause the character to drop only half the normal distance while a thin atmosphere will cause the distance dropped to double. Heavier or thinner atmospheres will prevent gliding. Altered gravity will also affect how far you can glide as shown on the table below:

Surface Gravity	Altitude Lost per Turn	Distance gliding per meter dropped
1.2	14	.5
1.1	12	.75
1.0	10	1
.9	9	1
.8	8	1.5
.7	7	2
.6	6	2.5
.5	5	4

Round down in all cases. Gliding is not possible in heavier or lighter gravity than the table lists.

There is no maximum distance a character can glide if they start off high enough off the ground but there is a time limit. A character can glide for a number of turns equal to the tens digit of their current Stamina. After that, the character must make a gliding check each turn or begin falling. A falling character falls up to 180 meters each turn, and may make a gliding check at the end of each turn to recover and begin gliding again. A glider who loses 10 or less meters of altitude in a turn takes no damage when landing, otherwise they may subtract 10 meters from the altitude lost for falling damage.

These rules are not designed to be hyper-realistic. I just thought that a 1:1 glide ratio is barely not falling and came up with a set of rules that made gliding races like the Yazirian really good at gliding.

Languages

Each character knows Pan-Galactic and a language spoken on his home world at 100%. Characters may learn other languages for 50 units of training. This allows them to become trained in the skill (Use Per for initial skill level). When using a skill that requires communication, use the

lower of the character's skill or language. A character may speak normally but must roll against his language skills in stressful situations or when there is a chance of misunderstanding.

Polyvox: When using a polyvox, a character can use the polyvox's skill in a language instead of his own. A polyvox gains 1d5% per hour of exposure to people speaking a language. A polyvox can act as a teacher for languages it contains.

Tweaking Skill Improvement

There are several changes that can be made to the Learn by Doing system:

- **Less Randomness:** When an improvement roll succeeds, a trained or favored skill improves by 6% while an untrained skill improves by 3%. Favored skills still improve by 1% when the improvement roll fails.
- **Improve each session:** Improvement rolls are made at the end of each game session, IE at the end of an evening of gaming. No more than 4 trained or favored skills and 2 untrained skills can improve each session.
- **Faster Abilities:** A character may improve more than one ability at a time but may not improve both abilities in a pair at the same time. Thus a character could improve his stamina, reaction speed, and leadership but not his dexterity in a single session.
- **I'm a Special Snowflake:** Instead of gaining 2 trained skills and 1 favored skill, starting characters gain 3 favored skills. When a favored skill reaches 100, a character can select another skill to be favored. Trained skills can be acquired through training or character options.

Sidebar: How does Learn by Doing actually work?

Learn by Doing has a lot of good characteristics: Organic character development and little or no record keeping being chief among them. However it isn't always obvious just how fast skills will improve with this system.

Since succeeding at an improvement roll is the same as failing at a skill roll, low skills tend to improve much more often. Trained skills improve roughly twice as fast as untrained skills. Favored skills improve only slightly faster than trained skills when the skill is low but much faster as the skill improves and improvement failures increase. Overall, a favored skill will reach 100% about twice as fast as a trained skill. The following table shows the number of improvement rolls needed to take a skill from 15% to 100%

Skill Level (%)	Average Number of Improvement Rolls		
	Untrained	Trained	Favored
15	0	0	0
45	16	9	9
70	36	19	17
100	132	71	35

These are average numbers for pretty much the slowest case, a character with a 30 in the relevant ability and no trained bonus. A starting skill of 45 would need about (19-9) 10 rolls to reach 70 and 62 to reach 100. The favored skill reaches 70 in only 9 rolls and 100 in 26.

Note that for trained and untrained skills, most of the attempts occur in the last 10-15 skill points. Reaching a skill of 80 requires only about 1/3 the rolls that reaching 100 requires. Reaching 90 requires about half-60% of the rolls that 100 does.

This is actually another good point about the Learn by Doing system. Characters quickly reach levels of competence but mastery takes quite a while. Characters are improving in many ways at the same time so they develop broad competence and narrow mastery.

Compare this to Bill Logan's excellent "A Skilled Frontier"(ASF) system in Sfman #9. Let's assume a character with an ability of 70 and a level one skill in his primary PSA. That's a starting skill of 45. The Learn by Doing(LbD) character also starts off with a skill of 45.

Reaching a skill of 75 with ASF requires buying to level 4. That requires 27 xp for a primary, 36 for a secondary, and 72 for a tertiary. Assuming 6-10 xp per adventure, that means it takes 3-5 adventures for a primary, 4-6 for a secondary, and 8-12 for a tertiary. The LbD character will take about 8 adventures for a favored skill, about 10 for a trained skill, or about 28 for an untrained skill (the untrained skill starts from 30, not 45).

Reaching 95 from 45 is similar. The ASF character buys a skill to level 6 from level 1. The XP required for primary, secondary, and tertiary is 60, 80, 160 respectively, thus 6-10, 8-14, 16-27 adventures. LbD character will require about 25, 40, and 100 adventures for favored, trained, and untrained skills.

So make no mistake, as presented Learn by Doing characters take longer to reach the highest level skills. The trade off is much broader skill set. The ASF character who has a level 6 skill after 10 adventures might have improved one attribute a bit and bought a couple other level one skills. The LbD character after 10 adventures has 6-10 skills at 70%, one or two favored skills a bit higher than that, and every other skill he uses is around 50%. He's also had 10 chances to improve his ability scores. He's not as good at the ASF character's Specialist but he's a much more well-rounded character.

It's important to remember that when using A Skilled Frontier (or any other XP based system) you have control of where to spend the XP you get. If you take a diplomat with no survival skills into *Crash on Voltarnus* and manage to survive, you only gain survival skills if you spend some of your XP on them. You have complete control over your character's growth.

With Learn by Doing, you still have control over your character but his experiences also influence his growth. The same diplomat would learn something about survival (and possibly sticking spears into quickdeaths). This isn't generally a problem, he won't rival the explorer in surviving. Many characters are defined, at least initially, by what the character *can't* do. If you're playing the social butterfly who is useless in the wilds, Learn by Doing is going to eventually make a social butterfly who can actually make his way in the wilds. Character evolution is generally a good thing but it is something you need to be aware of.

Specialists are still going to be better than everyone else in their specialties but rather than the 50-60% gap, LbD produces a 30-50% gap. The flip side of this is that specialists are no longer completely useless outside of their Specialist. And remember, you won't gain skills that you don't use so characters don't end up as carbon copies of one another.

The tweaks listed under Tweaking Skill Improvement have various effects:

- **Less Randomness:** This option removes some rolling but doesn't actually change anything as it replaces the die rolls with their averages. If you wish to increase the die sizes 1d10 (average 6) for untrained and 2d10 (average 11) for trained and favored skills, you will roughly double the rate of progression.
- **Improve each session:** This increases the rate of skill gain to be roughly equal to A Skilled Frontier's rate or a bit faster. It is still slower than the linear progression Bill Logan outlines. Use this with larger die sizes for really quick advancement although still slower than linear progression.
- **Faster Abilities:** Honestly, the restrictions on abilities are arbitrary and designed to keep people from having to recalculate every skill bonus constantly. Faster Abilities relaxes that but some groups will be comfortable with allowing improvement rolls on every ability each time.
- **I'm a Special Snowflake:** This option is intended to allow specialists a bit more differentiation for those groups who feel they need it.

All in all, Learn by Doing characters are not more powerful than characters built with A Skilled Frontier. Eventually though Learn by Doing characters acquire many more side skills.