Experiential Learning:
Examples

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Experiential Learning 4: Sample Exercises

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Contents

All Pat Hands

Overview

The All Pat Hands simulation is designed to teach a variety of lessons about design.

The simulation is designed to model the response of individuals and teams to "higher level" technologies. In particular, forming individual poker hands of high value is supposed to be like approaching design on a low level basis. There are also rewards—potentially higher—for getting better at high-level designs. In this case, design is represented by the ability to take a larger view than a single poker hand at a time. Sometimes you have to sacrifice a high-scoring hand, like a straight flush, in order to attain a bonus for four or five pat hands.

In this simulation, then, the individual or team has the choice of improving hands for quicker but smaller returns or improving sets of hands for slower but larger returns. At the same time, the designers cannot allow themselves to lose sight of either high or low-level designs.

There is a third level of design, that of proof. Above the level of simple intuitive design is a theoretical level on which we can prove things about a design. Proof of design is much harder—though ultimately more rewarding—than design by intuition, but it may be beyond our grasp. So, in trying for the great and tempting rewards of proof, we may waste time that we could have used profitably, turning out intuitive designs.

The proof level in this game is simulated by the claims, or challenges. A team may claim their design by showing the cards as they've arranged them, but if they believe it's impossible to form 5, or even 4, pat hands from their 25 cards, they may challenge. Then the facilitators must try to disprove their claim by rarranging the cards. If the team's claim is wrong, the team is penalized, but if the failitator's cannot disprove their claim, the team earns a bonus.

Different size and different composition teams are formed to give each class a chance to see a variety of ways that a team or individual can approach a task. Hopefully, we can then relate the insights of the simulation to our own organization.

Logistics

Number of Participants

This simulation can actually be done with a single participant, though more learnings are available when there are at least several participants whose progress can be compared.

Facilitators should practice making designs before the first time they run the exercise, so as to gain a feel for what the participants are up against.

There's no maximum number of participants, but we've never tried All Pat Hands with more than 24.

Duration

We typically run this simulation for one hour, then generally process the inventions for two hours or more.

Props

For each team, provide two decks of poker playing cards, with different backs—so the two decks don't get mixed up. Have several extra decks available in case larger teams request additional decks to work with.

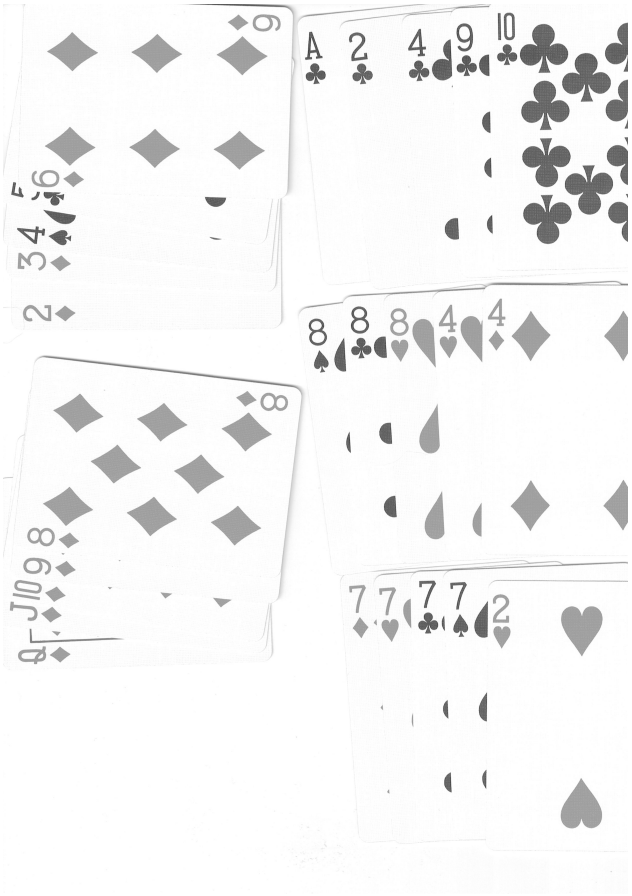
Also provide some means of recording and posting scores as the simulation proceeds. If possible, graph the teams' scores over time.

Instructions to participants and observers

ALL PAT HANDS

A Simulation of Learning to Design

In this simulation, you are given points for designs. A design is based on a set of 25 playing cards. Here's an example of a design:



Better designs get more points, and your objective is to get as many points as possible in the time allotted.

Subset Points

Your job as designer is to arrange each such set into 5 subsets of 5 cards each. Each subset will be scored as a poker hand, according to the following table:

Straight = 1 point

Full house = 2 points

Four of a kind = 3 points

Straight flush = 5 points

Any other hand = 0 points

Points Given for Each Set of 5 Hands

Additional points will be awarded for the design of the entire set of hands. If the set contains exactly 4 pat hands, then a bonus of 5 points will be added to the score. If the set contains 5 pat hands, then the bonus will be 20 points.

Challenge Points

If you feel your set of 25 cards is particularly unsuited to good designs, you can claim an extra bonus for bad luck. To receive a bad luck bonus, present the set for scoring, then state your challenge: "This set cannot be made into N pat hands."

If N = 4, and you are correct, then you receive 100 extra points. If N = 5 and you are correct, then you receive 50 extra points. If, however, you are incorrect, and N = 4 or 5, you lose 100 points.

Description of Hands • Flush: Any five cards of the same suit (spades, diamonds, clubs, or hearts) not in sequence

• Straight: Any five cards of two or more suits in sequence

• Straight flush: Five cards of the same suit in sequence

• Full house: Any three of a kind and any pair of another kind

• Four of a kind: Four cards of the same rank with any fifth card

• Non-pat: Any hand that does not meet the criteria of the above hands.

Post-processing

After the simulation, we ask each team to show the entire class a graph of their points versus time, then talk briefly about what they learned and how their strategy changed as they progressed through the simulation. We allow some questions, but mostly wait until all teams have presented before opening to a general discussion.

We may use a variety of other invention tactics, depending on the outcomes. One favorite is "What would you add, drop, and modify if you were to do another hour?"

If some team has been much more successful than others, we may allow time for them to demonstrate their design method to other teams.

We've never distributed pre-prepared handouts for All Pat Hands, allowing each class to develop their own learnings, and possible handouts. For instance, the class may collect and distribute "learnings about design." (We may help by pointing out learnings they haven't noticed or articulated, but we don't want to give the impression that there were some learnings they were "supposed" to get, but missed. If they haven't experienced them, then those learnings can be saved for another day. Lecturing about them probably won't help.)

Warnings

This is a rich simulation, providing many opportunities for inventing new learning. And not just for the students. In one class out of dozens, we experienced a surprise difficulty. One of the students was a member of a religious sect that believed playing cards were tools of the Devil. He was forbidden to touch even a single card.

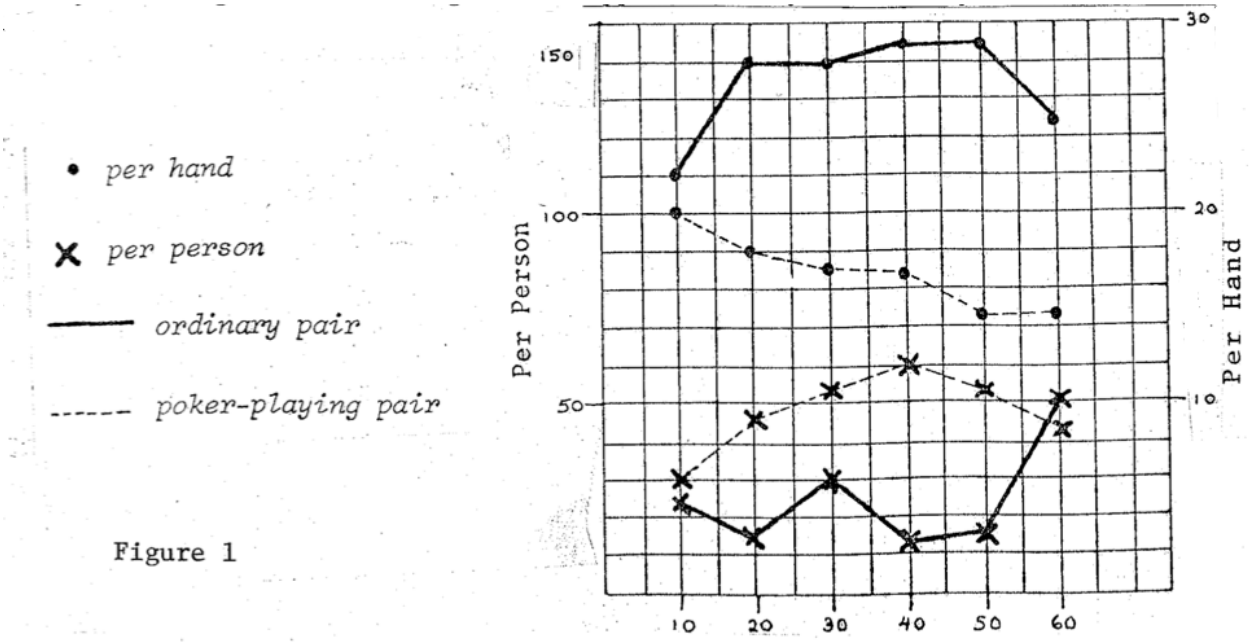
We offered him the possibility of staying outside the simulation as an observer, but he felt that watching other people do anything with cards would also be a sin. We excused him from that part of the class, but we never felt good about that solution.

It never happened again (so far), and I have never been able to think of a better solution. Perhaps someday one of my readers will come up with something. In the meantime, all we can do is hope this rare situation never happens to us again. But we remain always prepared to learn something new and surprising, and to deal with as best we can.

Stories

Two Different Pair Strategies

In the scoring graph of Figure 1, Pair A (dashed lines) consisted of two experienced poker players.



From the outset, they adopted a strategy based on constructing many good-valued poker hands as rapidly as possible. Their knowledge of poker enabled them to get off to a fast start at this, but even they showed some improvement in per-person score as they mastered this new task. They learned to work faster but produce lower "quality" hands, and this strategy led to increased scores until they started to get bored with the low quality task, at about 45 minutes. Then their per person scores began to decline.

Pair B (solid lines) knew the rules of poker but were not real poker players. They opted for higher "quality" hands from the beginning, not being so attached to the ideas of "goodness" carried over from poker experience. To them, getting a 5-hand bonus was more of an achievement than getting

two or three straight flushes. Their per-hand score was consistently high, and they rarely turned in a set with less than 5 hands. Although they were constructing "quality" hands from the outset, they were slow at it until they began to achieve mastery of the new technology, at about 45 minutes—just when the others were getting bored. Their total productivity then shot up and passed the pros.

The pros thought they were doing well, and they were, compared with those who knew little about poker to start with. Their previous knowledge of poker gave them an initial advantage, but also made them smug about their ability to do well in the game. As long as there was some room for them to learn how to carry out their strategy better, they remained interested and their performance improved. Eventually, though, they got "as good as you can be at this game"—to quote their exact words.

What they really did, of course, was to get as good as you could at the old game—the poker game, which corresponds to the lower level of design. In the meantime, the others were learning, too, though their learning didn't show up in the scoring for a good while. Not knowing what was possible, they several times took up valuable time trying to prove that a set could only be made into four hands. But, although they paid penalties for this work, they learned from it. By sticking with their high-level approach, they eventually mastered the method and their productivity took off.

Challenges and Confidence

One interesting sidelight is that the B pair would have taken off sooner, but from about minute 35 to minute 52, they were concerned with a set that turned out to be impossible to make 5 hands out of, at least as far as we were able to determine. Therefore, if you count this achievement according to the scoring rules, their average shoots way up even earlier. They also said they learned a great deal working on this 'impossible' assignment—a nice object lesson.

For those who would like to try, the hand was:

Clubs: 2 4 10 J

Diamonds: 3 6 7 8 9 A

Hearts: 2 7 8 9 10 Q A

Spades: 3 4 7 8 10 Q K A

The challenge behavior of an individual or team measures, in some sense, not just what they know, but how sure they are of their knowledge, and how reliable their performance actually is. Some interesting observations can be made from our experience so far.

There has never been a challenge in the 20-30 minute period. What seems to happen is that the "punishment" of failing early challenges in the 0-20 minute startup prevents the teams and individuals from trying immediately after. It's like having a design you were sure would work blow up in your face. For a period of time, you are more careful in your claims.

After the 30 minute mark, individuals often get up the confidence to make another challenge, but teams never do—except for one team that had a correct claim to make.

What this shows is that the team, when functioning, is a much more reliable judge of its own work than is the typical individual—at least as to its quality.

Team Versus Individual

This simulation offers many discoveries about the work of teams versus individuals, which may be of great interest to organizations attempting some kind of Agile transformation. Figure 2 compares the performance of the average single person versus the average 5-person team.

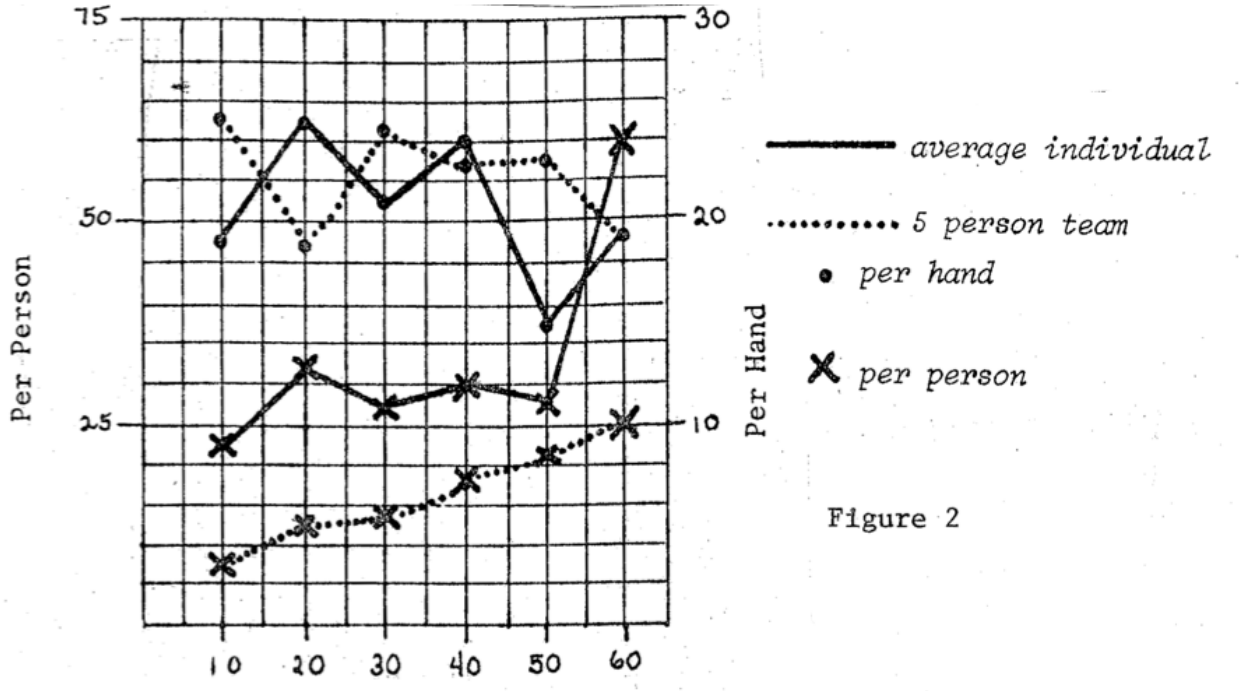


Figure 2

In both individuals and teams, the average per person score climbs, showing learning. The 5-person average is remarkable for the steadiness of its climb, showing learning taking place from the beginning at an almost constant rate.

3-person teams show this same sort of curve, typically. It's another example of how team behavior is more predictable than individual behavior, on the .average. The individual's profiles are wildly varying, but tend to average out to a curve such as shown—relatively flat until about 50 minutes, after which there is a "leap" of understanding concerning how to design sets of 5 pat hands.

Some individuals, however, make the leap earlier, while others don't make it during the one-hour exercise—though they might be expected to make it eventually. In the case of individuals, one typical behavior seems to be to try very hard to make a few high-quality hands, until about 40 minutes have elapsed. During this period, confidence is growing in one's ability to produce "the best" a set has to offer. Typically in the 30-40 minute interval, the individual finds a set that seems to make only 4 hands, turns this in with a challenge, and finds that it can indeed, make 5 hands. This experience "shatters" the individual's confidence.

One reaction to this shattering is no longer to try producing high quality sets, but to turn in any set that doesn't readily yield to attempts to design of 5 pat hands. At the same time, however, the individual is triggered into new thought patterns concerning the possibilities of design, which usually leads to a breakthrough near the end of the simulation.

Teams of 5 rarely, if ever, turn in a challenge. Social pressure combined with review processes tend to prevent "blunders." This conservatism can be viewed as an important advantage of a team, but has its dark side as well. Although the team learns steadily, it rarely comes up with a flash of inspiration when working under pressure, because of the tendency to conform to the present idea of the nature of the task. Thus, where a project must gamble on an inspiration to save it, the team may not come through, but the individual has a chance.

On the other hand, it's probably better not to have a project depend on a gamble, so team organization from the beginning may be superior.

Unfortunately, the simulation doesn't show that the educational effect was on a single novice with two experienced teammates as opposed to a team of three novices who had to fend for themselves. The three novices could certainly have benefitted from a little instruction in card handling, but, on the other hand, the two experienced players never allowed their novice partner to handle cards at all, so the novice learned nothing about that aspect of the task of designing sets of 5 pat hands.