

Learning Poker in Different Communities of Practice: A Qualitative Analysis of Poker Players' Learning Processes and the Norms in Different Learning Communities

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Abstract

Several studies have focused on some of the skill elements needed to become a successful poker player, but few have described the poker players' learning processes. No studies have used a learning theory to analyse poker players' variety of learning methods or analysed whether the competitive and deceptive nature of the poker game have an impact on the players' learning outcome. This article examines 15 poker players' learning processes and how the players enter different learning communities of practice, arguing that different communities have different norms. In a friendly community of practice, the players were generous in helping each other and revealed secrets so that the group could grow together. In the competitive community of practice, the players were more cautious, and misleading information was common. Online poker, as well as new technology, has made several new artefacts (learning tools) available for poker players, and their main contribution is to reveal information that was previously unavailable. Because poker is a game of information, it greatly affects the players' learning potential.

Keywords: poker, poker learning, poker skills, community of practice, qualitative study, young players

Résumé

Plusieurs études ont mis l'accent sur certaines compétences nécessaires pour devenir un joueur de poker performant, mais peu ont décrit les processus d'apprentissage suivis par les joueurs de poker. Aucune étude n'a utilisé de théorie de l'apprentissage pour analyser la diversité des méthodes d'apprentissage des joueurs de poker ni pour déterminer si la nature compétitive et illusoire du jeu de poker a une incidence sur les résultats d'apprentissage des joueurs. Cet article examine les processus d'apprentissage de 15 joueurs de poker et leur entrée dans différentes communautés de pratiques d'apprentissage. On y explique que différentes communautés possèdent différentes normes. Dans une communauté de pratique conviviale, les joueurs s'entraident et

révèlent des secrets afin que le groupe puisse grandir ensemble. Dans une communauté de pratique compétitive, les joueurs sont sur leur garde, et les informations trompeuses sont monnaie courante. Le poker en ligne ainsi que les nouvelles technologies ont mis plusieurs nouveaux outils d'apprentissage à la disposition des joueurs de poker. Leur principale contribution est de révéler des informations qui, auparavant, n'étaient pas disponibles. Étant donné que le poker est un jeu d'information, le potentiel d'apprentissage des joueurs en est grandement affecté.

Introduction

Among the different forms of gambling, poker is in a league of its own because of its skill elements (Bjerg, 2011; Parke, Griffiths, & Parke, 2005). Several studies have focused on some of the skill elements needed to become a successful poker player (Biolcati, Passini, & Griffiths, 2015; Bjerg, 2010; Dedonno & Detterman, 2008; Hardy, 2006; Parke et al., 2005; Palomäki, Laakasuo, & Salmela 2013b; Shead, Hodgins, & Scharf, 2008; St. Germain & Tenebaum, 2011), but only a few have focused on poker players' learning processes (Hayano, 1982; O'Leary & Carroll, 2013). So far, no studies have used a learning theory to analyse the variety of poker players' learning methods or discussed whether the competitive and deceptive nature of the poker game has an impact on the players' learning outcome. Because the vast majority of the research literature considers poker to be a game with a significant skill element (Biolcati et al., 2015; Bjerg, 2010; Jouhki, 2015; Leonard & Williams, 2015; Palomäki et al., 2013b; St. Germain & Tenebaum, 2011; see Meyer, Von Meduna, Brosowski, & Hayer, 2013, for an opposing view), this implies that these skills can be learned and further developed. Instead of determining how large the skill element is, or how it can be measured, I aimed here to be process oriented and to use a learning theory to study the players' described learning processes and their reflections about learning. In this study, poker was analysed as a community of practice, and four young professional poker players, eight young amateur players, and three "old-timers" were interviewed. The goal was to understand the players' learning processes and the learning methods they used to become better poker players.

This article discusses three research questions:

- How do the players describe their own learning process?
- What learning artefacts (learning tools) do they describe as the most rewarding?
- Does the competitive and deceptive nature of the poker game have impacts on the players' learning outcome?

Poker History

Live poker in different forms has been played since the 52-card deck was invented around 1840 (Hayano, 1982), but online poker is less than 20 years old (Arkin et al., 1999). However, online poker may have had a significant effect on poker learning

(Moreau, Chabrol, & Chauchard, 2016; Siler, 2010). O’Leary and Carroll (2013) state that online poker and the poker forums have revolutionized the game when it comes to learning, poker language, strategies, and discussing mathematical concepts concerning poker. They further allege that academic work concerning poker has failed to recognize how much online poker has affected live poker.

The period between 2003 and 2010 is referred to as “the poker boom” because of the growth of global Internet poker revenue from US\$365 million to approximately US \$2.4 billion in 2006 (Monaghan, 2008) and an estimated US\$4.99 billion in 2010 (Cook, 2016). There was also a massive increase in live poker playing (Mihaylova, Kairouz, & Nadeau, 2013; Shead, Derevensky, Fong, & Gupta, 2012). In 1999, the television show *Late Night Poker* used cameras inside poker tables (hole cameras) to display the players’ cards (Davy, 2015). This gave television viewers access to the experts’ perspectives and thought processes in a way they had never had before, which influenced poker discussions and learning possibilities for the viewers. The poker boom led to a blossoming poker economy and the possibility for many inexperienced players who would not have entered a casino or poker club to try the game for small stakes, or even “play money,” in the comfort of their own home. The number of players who were eager to risk their own money also grew, which led to rapid growth in the liquidity of player pools. There was much discussion and cooperation between experienced players on the poker forums about how the inexperienced players could be effectively defeated. In live poker, a player usually plays approximately 20 to 30 hands¹ per hour, compared with 80–100 hands on a single table of online poker (Barrault, Untas, & Varescon, 2014). These numbers do not include “fast fold poker,” in which players are moved to a new table and get a new hand as soon as they fold their hand (see Williams, 2019). Online, it is also common to play several tables at the same time (multi-tabling), which is not possible in live poker (Barrault et al., 2014). Studies have reported that as many as eight (McCormack & Griffiths, 2012) to 24 tables are played simultaneously (Hopley, Dempsey, & Nicki, 2010; Palomäki, Laakasuo, & Salmela, 2014). From these numbers, an online poker player may play 50 to 120 times more hands per hour than an offline player does. Playing several tables at the same time contributes to less statistical variance and increases the ability to target multiple weaker players simultaneously and thus increases the opportunity to maximize the profit (Barrault et al., 2014; McCormack & Griffiths, 2012; Palomäki et al., 2014). The speed helps the players gain experience from different poker scenarios quickly because they have played a large number of hands in a short period (McCormack & Griffiths, 2012).

Studies on Poker Learning

Research is generally lacking on both professional poker players and learning (Biolcati et al., 2015; McCormack & Griffiths, 2012; Moreau et al., 2016; Recher &

¹A hand in poker starts with all players receiving their cards from the dealer and ends with the winning player(s) collecting the pot. The speed of the poker game is measured by the number of hands played per hour

Griffiths, 2012), with a few exceptions. The earliest and probably most detailed study was Hayano's ethnography (1982). He completed his doctoral dissertation in anthropology in 1972 and then tried his luck as a poker player in California. He became committed to his fieldwork: "I felt the desire to give up my job as a university professor in order to spend more time in the cardroom" (1982, p. 148). After 5 years of intense playing, he began visiting the cardroom less frequently and started publishing his findings. This was approximately 20 years before the beginning of online poker. Hayano's pioneering study on poker players and the game's subculture is therefore valuable for understanding the changes in poker over the years. First and foremost, players learned from playing a lot (repetition); however, they also studied away from the poker table, for example, by working on poker math, such as "pot odds."² There were not many strategic discussions among players, partly because they were opponents and did not have the same *learning tools* as players have today. In live poker, unlike online poker, the players do not get any *hand histories*. A hand history is an electronic record of an online poker hand; it shows all the details of the hands that have been played. Remembering every detail of a poker hand might be difficult, especially for an inexperienced player. In online poker, it is possible to look at hand histories or even use a poker tracking program³ to systematize the hand histories into a database for statistical analysis. This makes it easier for players and their *learning partners* to have a meaningful discussion.

There are both similarities and differences between Hayano's (1977, 1982) description of the poker world and the descriptions of more recent authors (Bjerg 2010, 2011; Bouju, Grall-Bronnec, Quistrebert-Davanne, Hardouin, & Venisse, 2013; Laakasuo, Palomäki, & Salmela, 2016; McCormack & Griffiths, 2012; Palomäki et al., 2013b; Radburn & Horsley, 2011; Recher & Griffiths, 2012; Vines & Linders, 2016;). Hayano's informants preferred Five-Card Draw California style, a game of significantly less open information and skill than the most common poker variants played today. Texas Hold'em is usually the focus in more recent studies and is played by the vast majority of players online. In all the recent studies and in Hayano's (1977, 1982) study, the professional players were eager to highlight the element of skill, the importance of staying mentally sharp and avoiding tilt,⁴ and the need to continually make thoughtful decisions.

²Pot odds are calculated when a player makes a bet (or raise). The amount in the pot after a potential call, divided on the opponent's bet, is the pot odds. If a player bets 100 and the pot contains 300 before the bet (and 500 after a potential call), then the pot odds are 500:100 = 5 (or 4 to 1). If a player estimates that he or she has more than a 20% chance of winning the pot by continuing, then the correct play is to call or raise.

³A poker tracking program stores a player's hand histories in a database and allows the player to get statistics on all the hands he or she has saved, such as the percentage of hands played in the big blind and how much money he or she has won or lost when dealt a pair of aces. It also gives the player information about opponents and whether their play is conservative (tight) or reckless (loose). For details, see Pokerlistings (2018).

⁴"To tilt" can be defined as being emotional (typically being angry) and playing more aggressively and less rationally than normal. Players typically tilt after situations in which they lost the hand even though they were the statistical favourite (known as a bad beat) or if they were offended by other players (Moreau et al., 2016; Palomäki et al., 2014).

Another significant difference between Hayano's and more recent findings is that the poker population is younger in the more recent studies and they emphasize continual learning to a much higher degree (Bouju et al., 2013; McCormack & Griffiths, 2012; Recher & Griffiths, 2012). Poker has become more of a teamwork endeavour in which players cooperate to increase their skills and understanding to have an edge against other players (O'Leary & Carroll, 2013). O'Leary and Carroll (2013) conclude that a completely new online poker ecosystem has evolved since online poker started. It consists of online poker sites, poker forums, player reporting and tracking sites, and popular magazine and news, all of which facilitate learning for users. The most popular poker forum (twoplustwo.com) had 320,000 members who discussed strategy and different approaches to poker (p. 6). O'Leary and Carroll (2013) found that collaboration and cooperation was expected in an environment that they described as highly hierarchical. The most experienced players, who typically played high limits, were highly acknowledged by the other members, whereas new members were promptly put in their place. The discussions on strategies and hand histories allow the players to see how other players reflect and to learn what should be emphasized when playing. Along with detailed statistics from poker tracking programs, the players get a good foundation for meaningful discussions. It is interesting that collaboration and cooperation are so strong in a game that is highly individualistic and competitive (O'Leary & Carroll, 2013). However, none of these authors discuss the variety of learning methods, describe how the competitive and deceptive nature of the poker game influences learning, or analyse poker as a community of practice.

In addition to the learning resources discussed by O'Leary and Carroll (2013), there has been a growing industry of poker coaching sites, where players pay money to obtain access to videos of professional players or poker experts who answer questions and show hands while discussing strategy. It is also possible to buy personal coaching and individual feedback from a professional player or an expert (Palomäki, Laakasuo, & Salmela, 2013a). The Internet, videos, and hand histories make it easy to give players and their learning partners the same information.

A Competitive Game of Deception

To analyse the players' learning processes, we need to understand how the learning environment might differ from other learning environments. In poker, being deceptive and misleading may be part of the game strategy. To understand how this may affect the learning environment, we need to understand how these strategies are used.

According to Newall (2011), there are two main philosophies in poker strategy: an exploitive strategy and a game theory optimal (GTO) strategy. The exploitive strategy, the first and older of the two, aims to reveal the opponents' strategies and make counter strategies. The second strategy, GTO, aims to develop strategies that cannot be countered by an exploitive opponent. The exploitive tradition criticizes the GTO players for being mechanical and unable to exploit poor players as much as

necessary (Newall, 2011, pp. 6–20). In perfect information games⁵ such as chess, an exploitive strategy usually makes little sense and the winner is therefore likely to be the player with the most GTO strategy. Computers that use artificial intelligence are generally considered better than humans in these games. In imperfect information games, such as poker, the deception becomes more important and artificial intelligence struggles to find strategies that beat the best human players (Billings, Davidson, Schaeffer, & Szafron, 2002; Bowling, Burch, Johanson, & Tammelin, 2015; Hsu, Campbell, & Hoane, 1995; Koller & Pfeffer, 1995; Rubin & Watson, 2011). Poker players argue that the beauty of poker is the deliberate successful bluff because players win not because of which cards they possess, but how they play their cards.

Because poker is a competition against other players, it is profitable to trick the opponents into making mistakes. A direct attempt to annoy, upset, or intimidate other players is commonly referred to as *needling* in the literature (Abarbanel & Bernhard, 2012; Browne, 1989; Moreau et al., 2016; Wolkomir, 2012). Such attempts may be accepted and even encouraged in the poker game, even though it can make the game appear hostile and unpleasant for some of the players (Zurcher, 1970). Browne (1989, p.15) describes how successful players allure losing players with “red carpet treatment” to get them to stay in the game. The most successful poker players are likely to be those who, to a larger degree than their opponents, disclose their opponents’ strategies, conceal their own strategies, and manipulate their behaviour (Leonard & Williams, 2015; Siler, 2010). Although upsetting others is not a formally learned game strategy, it may greatly affect the learning environment and therefore necessitate source criticism to a much larger extent than in other learning settings. When having a discussion with opponents or receiving advice from them, it is essential to discover whether the opponent is genuine or, in Goffman’s (1978) words, putting on a performance. If we return to the chess example, it is unlikely that a player in a chess club receives intentional bad advice from other members; however, it is highly likely that a poker player receives bad advice.

Theoretical Framework

To analyse the players’ descriptions of their learning processes, I used Lave and Wenger’s (1991) theories on situated learning and learning in a community of practice. Their aim was to bridge the socio-cultural and cognitive learning perspective (Billett, 1996). Lave and Wenger (1991) emphasize participation and collaboration in learning and argue that all learning is situated in (created in and belongs to) a social and cultural practice. Because the learning is situated, it is problematic to take learning from one context (such as a poker game) and transfer it to another context (such as daily life). To develop context-specific knowledge, individuals need learning tools (artefacts). The way individuals learn is mediated (affected) by the artefacts they use,

⁵A game is defined as a perfect information game if each player is able to see all the events that have previously occurred in the game (Koller & Pfeffer, 1995). In poker, each player’s personal cards are hidden and therefore none of the players has perfect information (Newall, 2011).

including language, books, and computers. Therefore, changing the artefacts that individuals use while learning will lead to a different understanding. Knowledge does not exist in a vacuum, nor is it created in one: It is always mediated (negotiated) by the cultural and historical context in which it is situated (Dysthe, 1999). A mediator could be a teacher or a more experienced peer. Through interaction with others, individuals obtain the intellectual tools needed to understand and process their impressions and develop knowledge (Bråten, 2002). Because learning is described as heavily contextual, it is best understood in the specific learning environment (the community of practice). Every practice community needs to recruit new members to prevent the learning environment and the collected knowledge from dying out. Lave and Wenger (1991) describe the process that occurs when newcomers strive to become experienced members of a community of practice as *legitimate peripheral participation* (LPP). The word *legitimate* implies that the learner's task is necessary and important; the word *peripheral* implies that the learner starts with a small contribution until he or she has gained more experience, and the word *participation* emphasizes the social process in which the learning occurs. In this process, the newcomer starts by observing more experienced others and by making small contributions through simple tasks (peripheral participation). The aim for the newcomers is to understand the importance of their contribution, obtain acceptance from the more experienced members of the group, and change their self-understanding (or identity) in a way that incorporates the values of the practice community in order to become a more central participant, in other words, to feel like a "real" poker player.

Wenger (2000) further developed the term and described three modes of fitting into a social learning system: *engagement*, *imagination*, and *alignment*. Engagement is the process of cooperating with other members of the practice community and discussing, collaborating, or producing artefacts. Imagination is a more reflective and distanced process that involves the learners' self-image and seeing the bigger picture. It involves being able to undertake complicated trains of thought and understand how different topics are related, thus understanding some of the old-timers' reflections for action that would otherwise seem strange. Alignment involves ensuring that local activities are sufficiently aligned with the community, or subtracting general ideas into specific tasks. An example of alignment is studying a recipe from a cookbook and changing the way one makes a certain dish in order to better fit a cooking tradition. Among these three modes, engagement is considered the most social because it always involves interaction with others, and imagination is considered the most individual because the learner needs time to reflect on previous activities and to mentally prepare for future scenarios. The learner needs to balance these three modes in order to develop skills. Within the communities of practice, there is a repertoire of learning resources and the most competent members are able to take full advantage of a large "learning toolbox." There are boundaries between different learning systems. However, they are usually rather fluid and may be caused by the participant's level of knowledge rather than intentional exclusion: "By participating in these communities, we define with each other what constitutes competence in a given context: being a reliable doctor, a gifted photographer, a popular student, or an astute poker player" (Wenger, 2000, p. 229).

In order to align Wenger's (2000) theories to the informants' learning processes, I used the term "engagement" herein for playing poker or collaborating for learning purposes. The term "imagination" is used as the process of reflecting about the poker game when playing, or more general reflection about poker strategy and game theory; and the term "alignment" is used as the process of mediating general theoretical concepts into specific game situations.

For this article, Lave and Wenger's (1991) theories are used in an attempt to identify some of the learning artefacts in poker and to describe the informants' LPP and how they seek a peripheral or more central position in different learning systems. Furthermore, these theories are used to analyse whether the collaboration in informants' learning can be understood as a community of practice and whether the competitive and deceptive nature of the poker game affects these learning communities or if there are boundaries towards other communities of practice.

Method

Participants

The data set for this study has also been used in two previous published studies (Talberg, 2017; Talberg, 2018). Four current or former young adult professional poker players, eight amateur young adult poker players, and three old-timers were interviewed by using an exploratory qualitative interview study. The informants each had a pseudonym that represented the first letter of their category: The former professionals a "P", the amateurs an "A," and the old-timers an "O." The term old-timer is used to differentiate them from inexperienced newcomers and emphasizes their identity as honourable experienced practitioners with a central position in the poker environment (see Lave & Wenger, 1991, p. 68). The old-timers are part of large network of players; combined, they have experience playing professionally before the poker boom, operating illegal poker clubs, and having discussions with most, if not all, of the famous Norwegian players. The three old-timers were between 35 and 50 years; their exact age is being withheld to ensure anonymity. The young players were categorized as professionals if they had had poker as their only income for over a year and earned an overall profit of more than US\$100,000 from playing poker. If they did not meet these criteria, they were categorized as amateurs. The 12 young poker players were between 20 and 30 years with an average age of 25.5. All participants had played the poker variant Texas Hold'em online and live for several years; the majority had more experience from playing online poker. A few had changed from Texas Hold'em to other poker variants (mostly Omaha). They were recruited by direct contact (all of the old-timers and one of the poker professionals), by advertisement during the first legal poker tournament in Norway with a cash prize (2015), through a Norwegian poker forum on the Internet, or by snowball sampling. All participants were male, and all of the interviews were conducted in Norwegian. Excerpts from the transcripts have been translated from Norwegian by the author.

Data Collection

The study was conducted after approval was gained from the Norwegian Centre for Research Data, which enforces ethical guidelines. The participants received an information sheet prior to the interview and were told that they were free to withdraw at any time. Either written informed consent (face-to-face interview) or verbal consent (phone interviews) was given. All informants consented to an audio recording of the interview, and they were invited to read through the transcriptions after the interview and to make comments. Three of the informants wished to read the transcription, but none had any comments. No attempts were made to control the accuracy of the informants' personal stories, and no psychometric testing or diagnostic gambling tests were conducted.

The first interview took place in October 2015 and the last in July 2016. Six interviews were conducted over the telephone and nine were conducted face to face. Even though the possibility cannot be excluded, no findings indicated any systematic differences in responses on the basis of the interview location. The interviews lasted a total of 30.3 hr. The shortest interview was 52 min and the longest was 203 min.

The interview was semi-directive, the interview guide consisting of 12 themes concerning the interviewees': (1) introduction to poker, (2) preferred stakes format and frequency, (3) learning process and strategies, (4) potential problems related to playing, (5) online poker experience, (6) live poker experience, (7) intra-game experience, (8) poker community, (9) combination of poker with life outside, (10) future poker expectations, (11) definitions of poker-related concepts, and (12) closing remarks. Questions about learning were not limited to the third theme. Within Themes 1, 6, 7, and 8, the players described themselves as participants and how they contributed in the poker community, and within Theme 10 (future expectations), the informants were asked what they would have to do to improve as players. The aim was to get the informants to talk spontaneously and to naturally cover as many of the aspects as possible rather than allowing the conversation to be determined by the order of the interview questions. All of the interviews were conducted and transcribed verbatim by the author. The informants did not receive any compensation for participating in the study. The program HyperTRANSCRIBE (version 1.6) was used for transcribing and the program HyperRESEARCH (version 3.7.3) for analysing the data.

Data Analysis

The aim of this study was to understand and analyse the players' learning process, experience with different artefacts, and learning communities. The transcripts were analysed by using thematic analysis, "a method for identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke, 2006, p. 79). The goal is to systematically capture what is important about the data and to detect the patterned response. Coding is a process in which one moves back and forth between the data corpus and extracts from the data. Developing themes can be determined

either inductively (developing themes from the texts) or deductively (creating themes on the basis of theoretical knowledge in the research field). A theme or code captures parts that are relevant to the research questions. Aspers (2009) argues that theory is needed to analyse the participants' narratives, as, without theory, one is just performing storytelling. Thematic analysis fits well into critical realism, which acknowledges that the informants' stories represent presentations of themselves and how they create meaning from their experiences (Braun & Clarke, 2006). To analyse the players' learning processes, I actively used the theoretical framework of the article; however, the players' stories were also used to challenge and modify the theory to avoid forcing the stories into fitting our presumptions. The themes of the article were tentative throughout the process of collecting data, analysing, and writing.

Themes Used in This Article

For this article, four major themes and 10 sub-themes were developed. The major themes consist of three different steps in a learning pyramid, see figure 1. The sub-themes consist of 10 different forms of learning. In the second step of the learning pyramid, two different learning communities of practice display how learning is affected by the atmosphere, which may be described as either friendly or competitive.

Step 1. The first step involves progressing from an infrequent gambler to a dedicated student of poker (major theme). The first threshold towards becoming a good player is to understand the element of skill involved in the game, to understand

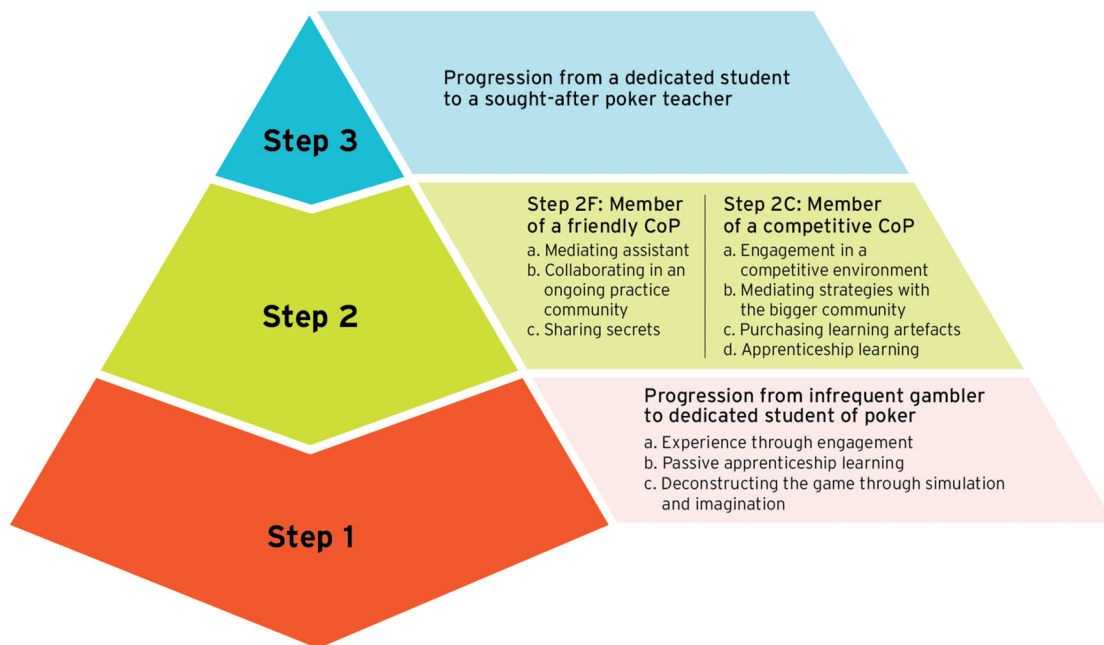


Figure 1. The poker player's learning pyramid. The major themes are written in bold font and constitute the three steps of the ladder, with two different dimensions shown in Step 2 (CoP = community of practice).

the rationale behind some of the rules, and to want to study the game. The three sub-themes (1A: experience through engagement, 1B: passive apprenticeship learning, and 1C: deconstructing the game through stimulation and imagination) are based on Wenger's (2000) three modes of belonging, which are elaborated on in the theoretical framework. These four themes were all conducted deductively. Experience through engagement (1A) is the level of the player's involvement in the activity, in other words, their volume of playing. It is not equal to playing time because it is possible to play several tables simultaneously online and thereby increase the volume and gain experience fast. Passive apprenticeship learning (1B) is the process of learning from observing more experienced members of the community. This can be done by observing leading authorities in the field through television, reading books, watching learning videos, or streaming. It is defined as passive because it does not involve interaction with the more experienced players. Deconstructing the game through simulation and imagination (1C) is the process of "after work" and preparation between playing sessions. It may involve using software to make statistical analyses of previous hands or simulations of future hands. All themes in Step 1 are primarily based on an individual process, whereas all themes in Steps 2 and 3 involve interaction with others.

Step 2F. This step, being a member of a friendly community of practice (2F: major theme), was constructed deductively and based on Lave and Wenger's (1991) learning theory. The three sub-themes (2FA: mediating assistant, 2FB: collaborating in an ongoing practice community, and 2FC: sharing secrets) could be understood as three different types of learning artefacts or learning methods and were constructed inductively on the basis of the informant's stories. Mediating assistant (2FA) involves playing online poker while discussing strategy with a more experienced peer. Collaborating in an ongoing practice community (2FB) is defined as taking part in an ongoing study group or continually discussing poker-related topics with a group of friends. Sharing secrets (2FC) is choosing to reveal hidden information in order to help the group reflect, although it may affect the player's short-term results.

Step 2C. This step, being a member of a competitive community of practice (2C: major theme), is a modification of the classic community of practice theory and caused by the competitive and deceptive nature of the poker game. The theme can therefore be considered as inductively driven. Mediating strategies with the bigger community (2CB) was the only one of the four sub-themes that was conducted deductively. The other three (2CA: engagement in a competitive environment, 2CC: purchasing learning artefacts, and 2CD: apprenticeship learning) were constructed inductively. Engagement in a competitive environment (2CC) involves discussing strategy and information with opponents while playing. Although this may be rewarding, some of the information can be intentionally misleading and source criticism is therefore needed. Mediating strategies (2CB) with the bigger community is defined as discussing hands with strangers outside the table. This typically takes place in online poker forums. Purchasing learning artefacts (2CC) involves buying a package of videos intended for a specific playing format. Apprenticeship learning (2CD) is purchasing guidance from a more experienced peer. All four sub-themes

require either giving money to the learning partner or considering the learning partner's true intentions. This is unique to social learning systems, which are usually less deceptive and competitive.

Step 3. The last major theme, progression from a dedicated student of poker to a sought-after poker teacher (inductively), involves not only being able to develop strategies for oneself, but also to be paid to participate in less experienced others' learning processes.

Results

Step 1: Progression from Infrequent Gambler to a Dedicated Student of Poker

All careers have a starting point, and the players' first impressions, and early motivation, can tell us something about why they regard poker as fascinating and what made them become dedicated players. Even though all of the informants reported that they had played poker at some point in their early childhood, for most of them, this was not a significant factor towards becoming a dedicated student of poker. The word "student" implies that they are interested in and willing to invest in learning and that they consider poker to be a skill that they can improve. The investment could be time, money, or concentration. Some of the informants described a change in mentality as they transitioned from playing for fun or just gambling to playing in order to learn.

Generally, almost all of the informants described their introduction to poker as a highly social process. The two exceptions were Alfred and Otto, who discovered poker themselves after reading about it on the Internet and started playing for moderate amounts or for play money on poker sites. Oscar and Oliver were introduced to live poker after participating in a leisure activity. Alex, Peter, Austin, and Andy had friends who played live poker; and Arthur, Aaron, and Patrick were introduced to online poker by friends. The two last informants, Andrew and Pierre, were introduced to live poker from older family members (brothers or cousins). All of them had experience with card playing and described the first phase as exciting, even though it took some time to understand the skills of the game. Several of the informants admitted that they considered some of the rules⁶ to be excessively rigid in the beginning, but after understanding more of the game, they found themselves advocating some of the same rules later on. This illustrates how they incorporated some of the rationale behind the game and changed their identity towards becoming a "real" poker player.

⁶There are many rules in poker that might surprise a newcomer. Here are four such examples: When a player makes a bet or raise, all chips must be pushed into the pot in one motion (to avoid string betting); if a player uses only one chip, it is considered a call and not a raise unless the player verbally states "raise" (one-chip rule); a player is not allowed to fold his or her cards before it is the player's action; and chips are not allowed to be thrown into the pot (splash). For details, see Pokernews (n.d.).

In a classic community of practice, the learner starts with only peripheral participation. In poker, the players often described starting to play as a full participant right away; however, the stakes involved were moderate and the more experienced players had higher social status. The difference between playing high-stakes poker and playing poker against friends with a moderate stake is similar to playing sports as a professional athlete compared with playing sports in the backyard. Because it is possible to play with play money or to wager less than US\$1 when playing, poker offers an opportunity to practice as a full participant without taking financial risk. The poker players considered this as practice more than “playing for real,” in other words, a sort of peripheral participation.

The first crucial threshold towards becoming a dedicated student of poker was to understand some of the game theory and the skills involved. Patrick illustrated this process well: He was not in particular interested in poker, but several of his friends were active participants in the local poker community and insisted that he join them. After a while, he became interested when he noticed that a young girl consistently won against all the adults. He realized that there was “more to it” and asked her for some advice and learning resources.

The closest to classic LPP is described by Pierre’s introduction to online poker playing. He used to watch his older brother play poker online as often as he was allowed and only participated himself if his brother needed to use the restroom.

Peripheral versus central participation can also be understood as how often a player plays poker; how long a poker session usually lasts; and, if it is online, how many tables the player plays at the same time. When trying new learning artefacts, it was common to start as a peripheral participant and if the artefacts felt valuable, to gradually become a more central and active user.

Experience Through Engagement (1a). The most fundamental way of learning to become a better poker player is by playing poker, in other words, by participating. Online playing goes a lot faster than live playing, and it is possible to play several tables simultaneously. Even for a player who prefers live poker, playing online may be an effective way of gaining more experience fast.

All of the informants had spent a lot of time playing poker online, and most of them used to play at several tables simultaneously. It was most common to play at three to five tables simultaneously; however, some had occasionally played at as many as 20 tables at the same time. Pierre (27 years) was by far the most experienced after having played well over 10 million hands. If he had played the same number of hands live, it would have taken him 45.6 years of non-stop playing. This shows how much faster online poker is than live poker. Even though the professional players reported spending more hours playing poker than did the amateurs, the percentage of time spent playing compared with studying the game was lower among the professionals. In other words, the professionals also spent time on many poker-related activities other than just playing poker.

Passive Apprenticeship Learning (1b). Many of the informants enjoyed watching poker on television, especially early in their career. During the television programs, the rules and some basic strategies were explained, and it was easy to take the experts' perspective when watching their cards and to understand their decision process while being guided by the commentators. These programs offered the informants' an opportunity to take the different players' perspectives and imagine how they would have played the hand themselves. The hole cameras are a modern artefact that may work as an important learning tool for the players.

The thing about watching videos and stuff as well, it provides a lot of learning though. Watch how the best ones played. (Peter)

It is also a way of developing and maintaining interest in poker. Many have used sites such as YouTube and PokerTube to learn the rules of the game and which strategies to apply, or to follow the largest tournaments as a sport. A slightly more active process includes reading interviews, articles, or books written by professional players.

When it came to reading books, there seemed to be a significant difference in terms of age. The old-timers read a lot of books early in their career, but the younger informants (even the professionals) were not as interested in reading. Several of the informants argued that books only get you so far. Oscar (>40 years) had read parts of at least 100 books and took an academic approach to developing his poker skills. Oliver (>35 years) downloaded 80 books to master the game, but after a bit of reading, he no longer thought this method was optimal:

When I had come about halfway in it, I realized that I was getting to a point where those books were, if not obsolete, then at least outdated. To publish a book takes quite a long time. And after the poker boom in which we got the hole cameras, you got the commentators, you got odds calculations on the screen.... the poker evolution has occurred a lot faster. So when Doyle Brunson wrote *Super System* in the early 1970s it was revolutionary... But after the poker boom in the mid-2000s, there were so many assistive devices and so many hands being played, being recorded and analysed. (Oliver)

Reading others' ideas and poker theories enables reflection on one's own strategies and thoughts, which might be valuable for novice players. However, poker is a game where strategies are continually evolving, and adjusting to others' strategies is as important as developing the best strategies because no matter what an opponent does, if revealed, it might be exploited with counter strategies. Therefore, the ability to adjust becomes crucial, and books may become quickly outdated. Several of the amateurs stressed that watching experts play, although it was fun, had a limited learning outcome when playing against novice players because the experts' tactics were so advanced that it was hard to align the strategies to the amateur's regular poker games. Both reading poker experts' books and watching poker experts play is considered passive apprenticeship learning because the player does not interact with the expert. All of the informants had, to some degree, used these two learning

artefacts, although none of the informants had spent a significant amount of time on them for learning purposes in the last year. The single most dividing artefact between the amateurs and the professionals was using statistical tools.

Deconstructing the Game Through Simulation and Imagination (1c). In online poker, the players receive hand histories that can be systematized into a database in order to statistically analyse themselves and their opponents. The informants used this information to analyse previous poker sessions (after work) and make a plan for future poker sessions (preparations). In after work, counterfactual reasoning was common: “What would have happened if I did something else?” Oscar described this as one of the most important methods to improve his skill:

Yes, for me it is important in order to pay attention to what I’m doing. So I can watch it afterwards and go back and see: here it went wrong and what happened here? That is almost what’s most important. (Oscar)

Pierre also emphasized the value of analysing how he had played. Playing several tables simultaneously leaves little time for decision making. Therefore, when Pierre was in doubt, he marked the hand so that he could spend more time analysing it after the game had ended.

In Hold’em Manager [a poker tracking program], every time I have a hand that I’m kind of unsure about, there is this nice feature that you can click on the hand up to the left and then it will be stored in Hold’em Manager. So after each day that I play, I try to store every hand that I’m uncertain about and then I often review them afterwards. (Pierre)

Saving poker hands to analyse later and setting aside time for a continuous critical reflection of one’s own strategies and results demands a high level of imagination. Dedicating time to preparation and after work is one important difference between the professionals’ and amateurs’ approaches in this study. The amateurs spent little or no time on preparation and after work. Several of the amateurs reported that they had saved and shared hand histories to show friends how they were lucky or unlucky or made a huge loss or profit in a specific pot. This was, however, a result-oriented approach, unlike the professionals who had a more holistic and process-oriented approach in which they studied a number of specific hands in specific positions to analyse whether adjusting their own strategies was profitable. Even though Pierre was among the players who spent the most time on playing, he was by far the informant who spent the most time studying the game.

Author: Time distribution. How much time do you spend on playing versus studying poker?

Pierre: Maybe 80%:20% [80% playing] I guess. It used to be maybe 70%:30% before.

An even more imaginary process is to prepare for scenarios that might occur in the future. When making preparations, the aim is to come up with a game plan that

prepares the player for likely scenarios. It involves going through the poker database and evaluating how one has played different cards from different positions, searching for opponents' weaknesses, and finding more profitable strategies. Simulating hands, trying out different approaches, and working with ranges⁷ is also essential in this learning method. Working with ranges involves finding all the likely holdings that an opponent may have in any given game situation and finding the optimal strategy against this range. Compared with watching television poker and reading books, preparation is a more active and self-regulated learning method.

According to Paul (30 years), preparation was the key to being successful. He claimed that he did not look stressed while he played because he had spent so much time going through possible scenarios:

You make it look very easy because no one watches when you do all that preliminary work. When you watch live poker, you see someone that is in full control and that gives the illusion that it is easy. But it's not. It's a damn lot harder than you might think. (Paul)

Paul argued that if he realized he was unsure of what to do, this was an indication that he had not prepared enough. Occasionally checking hand histories while playing online could be seen as peripheral participation, whereas systematically analysing previous sessions and adjusting game plans to future sessions is central participation in this learning artefact.

In the next section, we examine how collaborating with others affected the players' learning process. Poker is highly competitive; nevertheless, the informants described a lot of fruitful cooperation with other players.

Cooperation with friends was described as being quite different from cooperation with strangers. The two settings could be understood as two different communities of practice with different norms. Whereas cooperating with friends was described as a friendly community of practice, cooperating with strangers was described as a more competitive or even hostile community and could require cost-benefit analyses. Because this significantly affects the players' learning, both need to be examined as two different dimensions within the second learning step. I have named the friendly community of practice Step 2F and the competitive community of practice Step 2C.

Step 2F: Member of a Friendly Community of Practice

Being part of a friendly community of practice where members played poker together, challenging each other and discussing tactics, was described as a pleasant

⁷A range is the number of likely hands that an opponent might have. If an opponent makes a raise in a given situation, one might suspect that his range is "AK," or a pair that is higher than tens (a pair of aces, kings, queens, jacks, or an ace and a king). When putting someone on ranges instead of guessing the exact hand, it makes it possible to calculate the odds against likely holdings and therefore it is more likely that one will make good estimates.

and effective way to develop skills. Several informants described an unwritten rule within the community: The money involved should not be so significant that it threatened the friendship. Three methods were identified in a friendly community of practice: learning from a mediating assistant, collaborating in an ongoing practice community, and sharing secrets.

Mediating Assistant (2Fa). The learning method described by the informants as the most rewarding was to observe or to be observed by a slightly better player while playing online and discussing hands with them. The mediating assistant helps the player align general poker theories into the current specific situations that occur in the game. This can include finding sufficient counter strategies against a specific player, considering crucial aspects of specific poker scenarios, or finding improvements in the players' playing style. The assistant is defined as a mediator because the assistant meditates (shapes) the way that the player reflects. One way of helping the player reflect was to ask good questions of the player. This might make an inexperienced player more successful than he or she would have been if playing alone. Online poker offers a unique opportunity to collaborate in this way because both players can see the cards on the computer screen and discuss the game without revealing their strategies to their opponents. This could be done either by sitting next to each other or by using programs such as TeamViewer or Skype. Peter saw a huge change in his poker results after using this method. He had played a lot of poker online and even though he occasionally multiplied his bank roll, he always ended up losing it all eventually. He discussed his problems with some more successful friends, and they asked if they could watch him play online:

They watched me play and they quickly understood what the problem was. I played too many hands...I was a decent player, like technically speaking, but when you play 50% of the hands⁸ and stuff, it becomes a bit difficult. Plus, I used to sit and watch them a lot. So it really went both ways. Not that I used to comment on them so much at the beginning, but I actually observed what they did to win. It was no worse than to simply fold some of the hands you initially wanted to play, then you would usually win against these guys in those days.
(Peter)

After making a small but significant adjustment in his strategy, Peter went from being a losing player to becoming a winning player. He even became better than his initial "teachers" and was able to return the favour. The way Peter described how he watched the others play without "commenting so much in the beginning" can be understood as an LPP where he gradually became a full member and even a mediating assistant for the others after he became more successful than his initial teachers.

⁸The percentage of hands a poker player plays defines whether he is loose (reckless) or tight (cautious). Playing more than 30% of the hands against five players or more is generally considered reckless because the player will often run into opponents with better hands (see Cardschat, n.d.).

Oscar had professional teaching experience and therefore he had more of a systematic approach when he decided that he should teach a few friends to become better players. He took a central position in the learning environment:

Back then I had my own recipe which I knew would work. Perhaps it wasn't necessarily the best recipe, but I knew exactly what to do in [a particular poker variant withheld to ensure anonymity] and was able to convey it...I told them this and then they played on their own at home and I got to see hand histories, and we also had sessions where we sat together and watched a couple of hands that I had picked out which were not good. It was pretty exciting and a bit fun. (Oscar)

Patrick (28 years) frequently read on a Norwegian poker forum about players who had moved to other countries to play poker or who worked for gambling companies. He was struggling with his bachelor thesis and more or less spontaneously decided to leave Norway to get to know these players. He learned a lot from several of the other players, but one of them stood out as the most significant:

This German is probably the person that has been most important for my poker learning curve. Because before that time I had learned everything by sitting alone pondering and reading threads and stuff on the Internet, and watching videos on the Internet. I had read a few books, too, but those books were limited in terms of learning outcomes. ... He played the same stakes that I did... We talked poker basically non-stop and discussed different hand strategies and what to do. And told each other everything we came across of useful information and things like that and in that sense, we became better and better together. (Patrick)

The way that Patrick describes his initial learning could be understood as a cognitive process; he was gradually developing a higher level of reflection after reading books, playing, using poker forums, and watching videos. To take his skills to the next level, he needed social interaction and a more active learning approach. He did not merely observe and adopt others' strategies, but also got feedback from others regarding his own strategies.

Andrew (23 years) also emphasized that working together with a mediating assistant was the most rewarding way to develop skills and maintain interest.

I made a great buddy in Trondheim who is, he is better than me though, but he and I spent a lot of time together and played together, and it was a lot of fun. And to be able to talk to people about poker and strategies is very fun, I think, and it keeps you motivated. (Andrew)

Some of the informants reported that they lacked close friends who were equally dedicated to poker and that this reduced their learning opportunities.

Collaborating in an Ongoing Practice Community (2Fb). To collaborate in an ongoing practice community is to continually discuss results from poker sessions,

analyse hand histories together, and share learning resources with a group of friends. Generally, poker learning was described as a highly social process. After individual studying or playing with strangers, it was common to discuss new insights with poker buddies and get feedback and reflections on performances. The method includes a high level of alignment because it involves discussing how concepts and learning may be transferred to competing against strangers. This is how Patrick, Andrew, and Paul described their experience with this method:

We were dead serious. This was our job, and we were going to become the best in the world. Maybe not in the world, but we were to become as good as possible. (Patrick)

The reason why I feel I know how to play is because I've always played with people who have been at the same level as me. That makes you feel as if you know how to play even though you might not be that good. So I guess we've learned from each other. (Andrew)

Due to a few coincidences, I came in contact with a foreign poker community. Before I had just made my own strategies and read into it. But then I had an exponential development. (Paul)

To feel part of a “poker team” that supported its members and shared ideas was described as highly motivating. This indicates that they value the social interaction in learning. The last learning method within the friendly community of practice was to discuss strategy while playing against each other.

Sharing Secrets (2Fc). Andy (20 years) liked to discuss hands while playing with friends and he thought that disclosing his tactics and secrets was the best way to learn. In the poker club, he kept some secrets and “tells” to exploit later on, but with friends, it was different:

I want my buddies to improve and to help me get better. In that way, we grow together. It does not make any sense to take advantage of every mistake they make just to make a few bucks. (Andy)

As Andy stated, learning was more important than making a profit while playing with friends. However, when playing against strangers, it was the other way around. Almost all of the informants argued that who they won money from was important. It was better to beat a stranger than a friend, particularly if the amount of money involved was significant.

Drinking alcohol while playing with friends was reported to be a lot more common than when playing against strangers. This might imply a more relaxed and friendly competition. New players in the group got advice and explanations in order to become full members of the group.

Within the friendly community of practice, sharing is caring. The informants described the aim as being to grow as a group and have fun rather than to compete

against each other. When playing together, winning is a point of pride, but bragging about successful bluffs can lead to a higher level of understanding and self-reflection in the group. When showing a successful bluff, the player chooses a social reward, such as compliments from the other players, at the expense of the potentially high financial reward that concealing their gameplay might contribute to when bluffing in the future. Engaging in a competitive community of practice, on the other hand, is quite different and should therefore be analysed as another dimension within the second step of the learning pyramid.

Step 2C: Member of a Competitive Community of Practice

Poker is a deceptive and competitive game in which it is possible to learn from strangers; however, opponents may benefit from providing misleading advice. This affects the learning environment in ways not traditionally seen in learning communities. For the same reason, giving away too much information may be costly. When learning from or with strangers, deciding what to share and what to withhold were described as more complicated than in a classic community of practice. The informants were not unwilling to learn from or with strangers, but they wanted to be sure that they did not just help others without getting something in return, especially if their advice could reduce their profit. Four different learning methods were identified: learning through engagement in a competitive environment (2CA), learning from mediating strategies in the bigger community (poker forums; 2CB), purchasing learning artefacts (coaching videos; 2CC), and apprenticeship learning (purchasing personal coaching; 2CD).

Engagement in a Competitive Environment (2Ca). In Norway, live poker is strictly regulated,⁹ and there are no legal poker clubs or casinos that allow one to play with real money. However, it is not hard to find illegal poker clubs. Some of the clubs are non-profit clubs and the stakes at these clubs were generally described as moderate. Non-profit clubs were more common in the rural parts of Norway. Other clubs were described as professional; the organizer made money by providing the game, and the atmosphere was described as competitive. It was common to be nervous when visiting the poker clubs the first time (especially the more professional clubs) and several informants described some of the opponents as intimidating.

According to Otto (>40 years), some of the non-profit clubs had several hand discussions, which helped the players develop their skills.

Otto: ...the young ones played a lot online, but they still went down to the local club on Fridays and received good coaching there as well; also, they had the edge of playing 2 million hands online and learning the mathematics by heart.

Author: So they were almost like study groups?

⁹Cash games are not allowed in any form. Tournaments with a maximum of 10 players and a buy-in maximum of 1,000 NOK (approximately US\$125) are allowed. One annual national championship with a few different tournaments with a cash prize is allowed (Lottstift, 2018).

Otto: Yes! To some extent it is still like that. At the smaller clubs and the smaller places in Norway it still is. People are having those discussions... And if you discuss a lot and learn a lot, then some players travel and play more tournaments than others, and they bring back their experiences to the club. So it's really good internal training.

Even though Otto highlighted the learning opportunities at the poker clubs, many of the younger players admitted that they were careful giving away information and described the activity as very competitive.

Alex (21 years) loved playing at poker clubs, even though it was quite different from home games:

It is a great atmosphere and people are nice, but I am not there to make friends. I want to learn something, become a stronger player, and win money.
(Alex)

As Alex states, playing with strangers is more competitive than playing with friends. Several informants argued that if you help your friends improve, the group will grow together, but helping a stranger can help him or her beat you. However, being nice and revealing a little may keep a weaker player interested enough to continue playing and, one hopes, to lose money. It is also common to mislead and increase confusion and superstition. Because deception is part of the competition, source criticism becomes crucial.

Mediating Strategies in the Bigger Community (2Cb). Online poker forums were popular, especially after the poker boom (2003) and for several years afterwards. There is one Norwegian forum and there are many international forums, *twoplustwo.com* being the largest. In the forums, hand histories, television poker, and general poker strategies are often discussed and the player mediates which theoretical considerations are valuable to enlighten different playing scenarios. It is also a place to find poker clubs or to make new friends. Almost all of the interviewees had used the forums to some extent, but the popularity of these forums has decreased significantly in the last few years. Some of the informants argued that players today are not willing to share information to the same extent as the informants were in previous studies.

Early in his career, Pierre found discussing the game with other players on Internet forums helpful because the best players were generous in giving advice, but now he thought many players were more cautious in terms of revealing their secrets. He claimed that the best players were no longer contributing to the forums, and, consequently, the value of the content had declined:

I spent a lot of time at the TwoPlusTwo forum. ... I used to be in there a lot to read and ask stupid questions, post stupid hand histories, and often received answers and learned a lot. You got the ones that played at the highest limits to

give you answers ... But people have become so cautious now, there is no one playing above 3–6¹⁰ who bothers to provide answers to anything. ... Before, there was much more openness about strategies among the best. (Pierre)

Patrick argued that poker forums were more helpful early in his career and because the average player was now more experienced than was the case right after the poker boom, the traffic on the poker forums had declined:

When you have reached a certain level, then it is as if a poker forum can only help you become so good, it has its limitations. And many reached those limitations at the same time in the poker community. (Patrick)

Even though most of the informants did not contribute to the poker forums by writing and producing artefacts, many of them still went there to read what others wrote. Pierre and Oscar used it to conduct research on their opponents and to take advantage of popular misunderstandings. Some of the younger informants said they were afraid to look stupid and therefore hesitated before commenting and asking questions. This shows how the amateurs chose a more peripheral position in the learning environment.

Even though several of the informants described the experts as being more cautious about losing their edge (domination) compared with the case shortly after the poker boom, the experts were still willing to teach the amateurs as long as they got something in return. Some of the learning from strangers has therefore gone from free to being paid for. This can be done via coaching videos on pay sites or personal coaching.

Purchasing Learning Artefacts (2Cc). Coaching videos can be defined as videos that are meant for instructional use, an artefact that the players may purchase online. Typically, an expert discusses crucial topics or strategy and displays analysis of poker hands to illustrate points. Most of the videos are on pay sites. The player typically purchases a package (course) of videos that are intended to cover a defined poker format (such as shorthanded, medium stakes, Texas Hold'em cash game).

Arthur (26 years) had bought several packages of coaching videos and thought of them as a good investment. Patrick also especially used videos if he was struggling and needed inspiration:

If I went through a hard time online, I used to watch coaching videos. And that was enough to spark the interest again. ... How can you play that hand better in the future and extrapolate it to other things? And then you started to think poker and then suddenly you started to play again. (Patrick)

¹⁰3–6 refers to the small and big blind (forced bets). When playing \$3–6 no limit (or pot limit), the minimum buy-in is typically \$300 and the maximum is \$600.

Pierre also found time to watch coaching videos, even when he was playing 60 to 70 hours a week:

Yes, I've been using a lot of poker videos.... When I played like 10 to 12 hours a day, I always used to, when I went to bed, to watch 2 to 3 videos. So I have actually watched videos all the time. ... But I don't watch everything. I only watch the players I respect, so it's not that many. (Pierre)

As Pierre states, although it is not hard to find learning artefacts such as coaching videos, it is important to find the videos that are right for oneself. In order to decide, one must evaluate the creators' competence and whether the topics discussed are relevant. To benefit from the artefact, players must be able to align the transfer of the concepts discussed with their own strategies.

Apprenticeship Learning (2Cd). Some highly respected players offer personal coaching that can be understood as a form of active apprenticeship learning. The most common way to do this is by the coach watching the customers' poker database (collection of hand histories) to find improvements (often referred to as leaks). This method has much in common with learning from a mediating assistant; however, it is a more asymmetrical relationship, and the apprentice has to pay the expert. Compared with the situation in passive apprenticeship learning, the player influences the topics and becomes the centre of focus. In addition, the expert (coach) is responsible for the alignment from general game theory to the specific player's playing style. Arthur described buying personal coaching as one of the most important things he had done to develop his poker skills. He found a poker coach on a poker forum and had six sessions with him. This is how he described the process:

I sent him hand histories from two "deep runs"¹¹ I had that week. ... He was very to the point. He went through the history and commented on my entire tournament and what he would have done differently and fixed my leaks. (Arthur)

In apprenticeship learning, the expert is responsible for the alignment from general poker theories and poker understanding to the specific apprentice playing style. Because different players have different playing styles, the concepts must be aligned to be useful. This requires a high level of imaginary ability.

Step 3: Progression From Dedicated Student of Poker to Sought-after Poker-Teacher

The highest step in the learning pyramid is to receive money to assist strangers in their learning processes. Similar to the way that an academic undergraduate student must pass one threshold before giving valuable advice on other students' papers and pass another threshold before being paid to lecture less experienced students, some poker players also went from students to teachers in the poker environment. Teaching others could be done by creating coaching videos or by individual guidance.

¹¹To "run deep" in a tournament means to outlast most of the players (get close to winning).

Both Patrick and Pierre had made coaching videos themselves. Producing learning artefacts for other players shows confidence in the players' own capacity and shows that they identify themselves as poker experts.

Paul's experience with individual guidance marks the difference between being a mediating assistant and providing apprenticeship learning, as well as the different norms in a friendly community of practice (free of charge) and a competitive community of practice (paid). He said he had helped a couple of friends free of charge, but charged strangers and acquaintances.

Author: How do you go about coaching someone?

Paul: I used to look through hand histories ... and watch him play, make notes, and look at possible errors. ... The majority of those you coach have a good idea of what poker is, but it's that little notch that keeps them from becoming as good as needed. So it's a fine-tuning. And also I think what many pay for is self-confidence because when you are coaching someone, then you have to be good at telling them when they are doing things right too.

Author: Ok, so then you have met them physically as well and sat beside them while they have played online?

Paul: That I have also done but mostly through Skype and TeamViewer. Now coaching is more about doing something about their database, like Poker-Tracker. And you can make a lot of difference with coaching, like seeing that in that spot you lose, so you have to eliminate this from this and that range for instance.

Author: And the ones that have coached, you have gone about it in the same manner?

Paul: Yes. I've been very lucky with the ones I have met, though. Regarding the coaching and stuff, then I feel I've learned a lot there. So it's clear that today poker isn't a one-man sport. All the best ones, at least that I have met, it is almost a team. You must almost be a team to make it work because it is so damn complex.

Here, Paul emphasized the importance of social learning and learning with others (in a community of practice) to discuss strategy and develop skills. In Paul's experience, players who pay for personal coaching were generally highly dedicated and skilled. To coach others is also valuable for the coach, as explaining may lead to questions that the coach had not thought about before. Pierre was the informant who had spent the most time on this activity. For the last 2.5 years, he had been coaching two players three times a week.

Author: Yes, how do you go about teaching those two?

Pierre: We use Skype a lot and then we go a lot through hands together... Though it's often that I simply sit and watch when they play. Occasionally, they

travel to XXX [where he lives] and then they sit and play five days in a row. And I just sit behind them, watching and asking questions.

Discussion

In this article, I analysed 15 poker players' learning processes towards becoming better poker players, described the learning artefacts they use, and discussed how the competitive and deceptive nature of the game affects the learning environment. To understand the way their careers have evolved, we must start at the beginning of their learning process.

From Gambler to Student to Teacher

The vast majority of the informants described the start of their poker career as a highly social process. In the beginning, it was common to play infrequently and to barely understand the element of skill involved. This is supported by earlier studies on young players' introduction to gambling (Kristiansen, Trabjerg, & Reith, 2015; Reith & Dobbie, 2011; Trabjerg, Johannesen, & Kristiansen, 2014). It was common to play for moderate amounts. The most experienced players had a leading position in organizing the game. Occasionally playing online for moderate amounts at just one table can be understood as peripheral participation in the poker community, whereas frequent multi-tabling on high-stakes tables may be described as central participation. The first threshold towards becoming a better player was to become a dedicated student of poker who had a desire to develop skills.

The main difference between the professionals and amateurs in this study was their dedication to learning. The professionals generally used a larger variety of learning artefacts and had a more active approach towards their own learning process. They were also better at imagination and alignment. When introduced to new learning resources, it was common for them to start as a peripheral participant. Most of the informants had experience reading the online poker forums; however, the threshold for contributing to writing about poker was high. Therefore, several of the amateurs maintained a position solely as observers. The amateurs prioritized engagement (playing), whereas the professionals also prioritized more imaginative processes such as deconstructing the game through simulation and statistical artefacts. According to Lave and Wenger (1991), a participant needs acknowledgment from experienced members in order to incorporate the values of the practice community and to identify as a central member. The highest level of the learning pyramid was to become confident in selling learning artefacts and in successfully providing personal guidance to other players. Only a few of the most successful players in this study had provided personal coaching or produced coaching videos.

What Learning Artefact Was Described as the Most Rewarding?

O'Leary and Carroll (2013) have argued that online poker has revolutionized the game and that research has failed to acknowledge how much online poker has

affected live poker. This study elaborates on some of these claims, although the focus is primarily on the players' learning processes and how technology provides new learning opportunities. I argue that one of the main differences between poker today and that of 20 years ago is all the new artefacts available that contribute to shaping the learning. The main contribution of the artefacts is to give the learner more information than was available before the artefacts were created. The hole cameras used in poker programs on television are clear examples of this. In the preface of his book *Poker Faces*, Hayano (1982) wrote, "But poker, even at the highest competitive level, is not a spectator sport. The real action of poker is concealed" (p. x). Although Hayano's statements were accurate when he wrote the book, today many would object to those claims.

In 2003, Travel Channel's coverage of the *World Poker Tour* became the network's most viewed program, and ESPN's coverage of *World Series of Poker* in 2003 is claimed to be one of the reasons for the poker boom. The aims of these programs were to present poker as a sport and to give television viewers access to the players' decision processes (Schuck, 2010). This coverage shows the power of an artefact in providing previously concealed information.

Browne (1989) argued that the best way to learn poker is by learning from winners. However, he concluded that finding winners who were willing to teach was difficult. The Internet makes both finding experts and having discussions with learning partners a lot easier. Poker forums offer an opportunity to collaborate with strangers who you are not competing against on a regular basis and to purchase personal coaching, or coaching videos, from famous poker authorities. Hand histories are another artefact that provides valuable information for the players and their potential learning partner because they offer detailed and accurate information that could be difficult to remember if the hand had been played live. When using a poker tracker, this information is stored in a database that offers information suitable for statistical analysis and deconstruction of the strategies, which would have been more or less impossible to conduct without these programs (Siler, 2010). Trackers also simplify learning with a mediating assistant and apprenticeship learning (personal coaching). All of these learning tools are artefacts that shape the way that people learn and eventually shape how poker is played.

Another important aspect is speed. Playing online is much faster, which significantly increases the amount of practice or poker experience. The game is always available, and it is common to play several tables at the same time. There are also possible play formats that are highly unusual in a casino or poker club, such as playing against only one opponent. The importance of professional players playing several tables simultaneously, getting less variance, and attacking several weak players at the same time has been discussed by McCormack and Griffiths (2012) and Vines and Linders (2016). In describing card rooms before online poker, Hayano (1982) stated that he usually played with the same players every day and that meeting new and potentially inexperienced players was almost considered hitting a goldmine.

Online, many of the professionals play at tables with low stakes that would not be profitable unless it was possible to play at several tables at the same time.

Does the Competitive and Deceptive Nature of the Poker Game Affect the Players' Learning?

The competitiveness and deceptiveness of poker makes it a unique form of gambling (Binde, 2005; Bjerg, 2010; McCormack & Griffiths, 2012), and it can be argued that this has a clear impact on the players' learning processes. Situated learning theory is well suited to analysing learning among dedicated friends. However, when it comes to learning with strangers, classic community of practice theory has its limitations. The competitive community of practice is a modification of the learning theory that captures the unique learning environment in poker.

In a friendly community of practice, the players were generous with helping each other and sharing strategies and learning resources in the hope that the group could improve together. In a competitive community of practice, players were cautious about giving advice that could help their opponents beat them, especially if they did not get something in return. Information from other players could be intended to mislead and therefore required critical examination. However, if one was willing to pay for it, personal coaching or coaching videos were described as great learning resources. Wenger (2000) described the boundaries between learning systems as fluid. Therefore, these two learning communities are to be understood as archetypes because there may be a continuum in openness for learning purposes between different communities, and different members of the same community may have different intentions with their engagement in the group.

Conclusion

This explorative qualitative interview study offers a starting point for examining poker learning, which has yet to be researched in the poker literature. I argue that the level of skill needed to become a professional poker player differs significantly from that in other forms of gambling and that the learning environment in poker is different from most other learning environments. The deceptive and sometimes hostile atmosphere in poker games requires a high level of source criticism and reflection from the players who receive advice from other players. To analyse the players' learning process, we need a learning theory; in this study, Lave and Wenger's community of practice was used as a theoretical framework. However, to fully understand the unique learning atmosphere that sometimes exists in poker, it was necessary to modify the learning theory and include a competitive community of practice as another dimension, along with the friendly community of practice.

To become a dedicated student of poker, the players had to understand the element of skill involved and some of the rationale for the rules in the game. The first step was to study the game outside the poker table and start to systematically reflect while playing.

To take the learning process a step further, players needed to collaborate with others. This could be done both in a friendly and a competitive community of practice. The highest level of learning described by the learning pyramid was to sell learning artefacts and advice to other players. Monitoring other players' learning requires a different skill set than is required to control one's own learning.

Although poker has been played for more than 150 years, the learning possibilities have increased tremendously because of modern artefacts that provide reliable information that was not available prior to online poker (before 1999). With online poker, the money involved in the game both online and offline has increased significantly, making the game a tempting career choice for some players. It also offers a different route to understanding some of the skills involved in the game. This study may give new insights into how poker players work on strengthening their skills and why they are so eager to promote the element of skill in poker, which is continually reported in other qualitative studies. This may help explain why poker can be so time-consuming and how some players are able to continually succeed in the game. More research is needed to examine whether the players' learning processes from this study are transferable to other players. If the hypothesis in this study is correct, the new learning resources and the increase in the number of players working systematically on developing their skills should affect the skill level of the player pool and this may again affect the poker community in several ways. Further research is needed to determine whether this leads to a larger diversity in players' skill levels and how they may have been affected by the poker boom.

Limitations

This study has several limitations. The informants interviewed were generally young successful players from a country where live poker is strictly regulated, but were not representative of poker players in general. Players from other countries may have access to other learning artefacts and there are probably differences between learning communities. The interviews capture only the interviewees' presentations of themselves and may therefore be biased. This study focused only on learning of technical, strategic, and statistical poker skills and not the psychological, emotional, and economic challenges of poker such as avoiding tilt, bankroll management, the stigma related to poker as a profession, or gambling problems. In addition, the study design is not suitable for generalizations or causal explanations.

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