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How can Venture Capitalist Behaviour be Learned and Trained? - The Co-Evolutionary Function of Start-up Financing

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Abstract— The financing of start-ups through venture capital is a considerable challenge. In the context of entrepreneurship education and the lived practice of entrepreneurship, the topic is often not discussed enough in terms of the importance of competence development (ability and willingness). This must be done on the part of both entrepreneurs and venture capitalists at different levels of learning in order to enable a fruitful interaction between investors and founders. In order to illuminate the connections between theory and practice, the conceptual paper examines what academic basis can be laid for entrepreneurship education in order to focus on the co-evolutionary learning of start-up founders and investors at different levels. Based on a systemic-evolutionary approach, it is shown that methods in entrepreneurship education can be tailored even more specifically to the needs of the actors. In addition, a curriculum for developing investor expertise in the venture capital context is presented on this conceptual basis.

Keywords: Business Angels, Co-Evolution, Entrepreneurship Education, Evolutionary Learning, Start-up, Venture Capital.

I. INTRODUCTION

Joseph a. Schumpeter believed that it is possible for 'real bankers' to channel economic surplus units into innovation-related deficit units. He ascribed to them special financial entrepreneurial skills and characterised their achievements as highly specialised work in which top performance through experience as well as intellectual and moral qualities are decisive. Schumpeter also refers to the historical validity of his financing theory, using the example of the financial entrepreneurial initiative of the Pereire brothers (founders of Crédit Mobilier in the 19th century). Nowadays, however, it is undisputed that banks (now) find it difficult to finance start-ups in their early phases. Informal financing is responsible for the majority of financing in the seed and start-up phases. These pave the way (together with the possibilities of crowdinvesting and public funding) for formal financial instituitions. Based on this, the question can be asked to what extent the investor behaviour of potential venture capitalists (VCs), respectively business angels can be learned and trained in order to strengthen the potential and thus the regional development and reproduction dynamics?

II. VENTURE CAPITAL AND BUSINESS ANGELS

The theoretical and empirical basis for business angels has only become more solidified since the 1980s. Business angels generally provide financial capital as an open investment (or in the form of mezzanine capital) in a still rather opaque market segment. They generally operate under the radar of the financial supervisory authorities, which is why they are referred to as an informal market for venture capital. It is estimated that the informal market for venture capital is several times larger than the formal market. There are a number of studies that show that this is not a region-specific phenomenon. Furthermore, there is thus an empirically verifiable and theoretically significant complementarity between the informal and formal markets for venture capital in the ideal-typical life cycle of innovative companies. Business angels are characterised by their preference to invest smaller amounts of capital in seed and start-up phases and to help the founder in the process: "Angels not only exist, they tend to invest in precisely the areas perceived as gaps in the capital markets for entrepreneurs" [1].

With their investments, business angels generally do not aim for current income, but for future-oriented proceeds from the sale of their investments ("patient money"). They therefore utilise the specifics of venture capital as an "innovation-oriented" financial technology, provide support as a sparring partner and "doorkeeper" and realise investment returns, sometimes very high returns, when exiting the investment via the capital market, through the sale to VC companies or repurchase by the founder. The money is provided to the founder by VCs in several financing rounds - usually when agreed milestones are reached. The investment horizon is usually 3-7 years, until the company has lost momentum, has advanced to later development phases and thus becomes interesting for other investors. The "temporary marriage" is ended with the exit in order to make the sales proceeds and entrepreneurial experience available again to founders in need. Angels are only replaced or supplemented by formal financing systems as the company's lifespan progresses and capital requirements increase. Banks and VC companies often require a combination with bootstrapping or angel capital, as this creates 'trust signals' that support credible communication in a situation characterised by uncertainty and asymmetrically distributed information [2].

For a long time, business angels have led a shadowy academic existence. There are still no standardised and clear demarcation criteria and the transitions to the formal VC market can be fluid. In general, there still seems to be disagreement today as to whether and to what extent

- bootstrapping financing from friends and relatives counts towards angel status or not;
- only active or passive investors ("hands-on/ hands-off") belong to the angel circle;
- phase and innovation orientation, asset ratios, capital volume and investment frequency are relevant demarcation criteria for the angel market;
- only VC financing in the form of open investments or alternative financing variants (e.g. mezzanine capital) constitute a statistically relevant angel transaction;
- direct investments by private individuals in listed start-ups or in the context of corporate investments can (or should) be regarded as angel capital;
- the origin of the financial capital and the founding experience are constitutive for a business angel;
- industrial companies, angel syndicates and angel funds can be categorised as business angels [3].

In order to document the complexity of the angel market, a series of typologies were drawn up very early on. For example, in a highly influential pioneering work from 1989, Gaston categorises the types of angel cooperation according to whether they result in a more fruitful or conflict-laden financing relationship for the founder. Accordingly, he assigns a characterising name to each type [4]. Gaston names the following angel types that are generally recommended:

- Godfather: The reclusive, retired godfather with financial entrepreneurial ambitions;
- The Peer: Younger angels who are still active in business themselves;
- Cousin Randy: An angel who only invests within his own family;
- Dr Kildare: This type of angel belongs to the traditional professions with high income and wealth (doctor, accountant, lawyer, etc.);
- Daddy Warbuck: Angel, who acts as a wealthy industrialist with charitable intentions;
- The Stockholder: A passive shareholder with entrepreneurial empathy;
- Very Hungry Angel: This is the type of angel with very little entrepreneurial experience who is nevertheless very committed, invests smaller sums and often seeks majority shareholdings;
- Fulltime Angel: Angel who is looking for full-time employment in the financed company.

In contrast, Gaston differentiates between a few types of angels that start-ups should avoid:

- Business Devils: These quickly seize control of voting rights, are characterised by an "aggressive" share valuation and invest primarily in small companies;
- High Fliers: Angels who expect returns of at least 40 % and prefer to invest larger sums in larger companies;
- Impatient Angel: Investor who only provides his/her capital for a short term (max. three years);
- Green Angel: An investor who has no entrepreneurial experience, usually acts as a passive investor and prefers to finance established companies;
- Nickel and Dime Angels: This type never invests more than $10,000 and does not have the money required for further rounds of financing, so problems of undercapitalisation occur more frequently;
- Corporate Achiever: This type of investor is an active manager in the middle of the hierarchy with no prospects of promotion, who seeks other activities out of frustration.

In principle, this categorisation is probably still valid today, although a lot has of course changed in the meantime. With the introduction of the internet, the development of new digital currencies, the establishment of crowdfunding platforms, increased media attention ("Dragon's Eye") and digitally networked angel networks worldwide, new types and financing patterns have emerged. A distinction can now be made between coiner angels, crowd angels and social angels, who operate with specific financial technologies and a particular investment focus on (social or ecological) sustainability. There are now also initiatives that are trying to increase the proportion of women in what was previously a male-dominated domain. The "Women Angels Mission '25" is a german initiative, for example, which aims to diversify the business angel ecosystem in Germany by promoting more female business angels. By 2025 the proportion of female business angels in Germany is set to rise to 25% [5].

With a certain analogy to Gaston's typology, specific types can already be identified here today:

- Ms Angelita: Young female investors who are themselves still active in day-to-day business and are involved in various investment focusses.
- Gal Pal Beate: Female angel investor with an awareness of gender-specific (and possibly other) characteristics of entrepreneurship and a special investment focus on start-ups and teams with a high proportion of female founders.
- Mrs Ratio: Female angel investor who considers gender-specific issues to be irrelevant for her own employment biography and angel investments and who applies "pure" common sense.
- Grandma Erna: Older female investor who, for example, has inherited assets from an entrepreneurial household and makes these available for entrepreneurial projects from the extended family circle.

In view of this heterogeneous market environment, it is normal for different specialisation patterns to emerge in the course of individual learning processes. However, it can be stated that a typical angel transaction has, on average, those characteristics that do not match the interests of formal financial systems on the one hand and the interests of classic bootstrappers on the other. The investment volume is generally between 50,000 and 500,000 euros, usually provided in several financing rounds. In addition to these real seraphs, there are also cherubs, i.e. small angels who also provide small investment sums of 10,000 euros and less for the seed and start-up sector of business start-ups. Business angels are to a large extent experienced start-ups themselves and are therefore often familiar with the requirements of utilising angel investors, have built up their assets through their own entrepreneurial activities and contribute their experience and capital to their start-up portfolio companies. They enter in phases where the liquidity and profit situation is critical and thus prove to be "take-over and turn-around artists" [6]. Special mention should be made of the frequently practised strategy of collecting sufficient financial capital for several rounds of financing via syndication and the preference for regional proximity, i.e. the local orientation of the investment activities of business angels. Business angels also often favour a certain familiarity with the sector (at least for the first angel deals). These aspects have proven their worth in co-evolutionary cooperation with start-ups and other angel investors in order to arm themselves against market and behavioural risks (see Chapter IV). A further angel categorisation by Coveney and Moore has proven useful in this context, which can facilitate matching based on the requirements of start-ups and the profiles of angels [7].

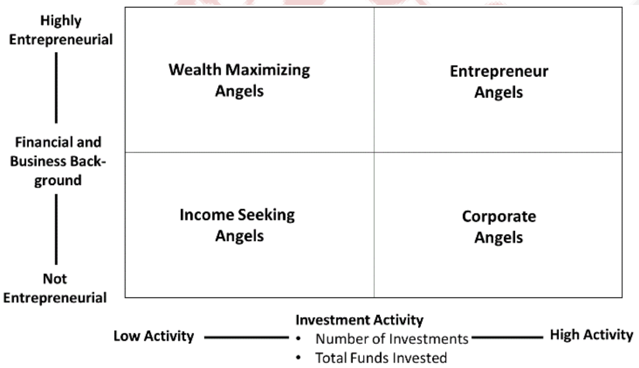

Fig. 1: Suitability of different angel types [8]

Accordingly, active angels include "income seeking angels", "wealth maximising angels", "entrepreneurial angels" and "corporate angels". Potential business angels are categorised as "latent angels" and "virgin angels". In view of the financial entrepreneurial characteristics of the individual angel types discussed above, fig. 1 provides an overview of angel categorisation with regard to their suitability for start-up-specific issues. As a systematisation approach, the amount of capital and intensity of involvement required from the founder's perspective are used to crystallise the suitability of the respective angel type for the financing relationship.

The financial assets of potential business angels have long been regarded as idle and therefore growth-relevant financial capital for start-ups. Latent and virgin angels have therefore also been discovered for theoretical and political purposes. They are "sleepers", so to speak, who have either had experience with angel investments in the past and need to be kissed awake from their slumber (latent angels) or have sufficient financial manoeuvring power and have shied away from angel investments for a variety of reasons (virgin angels). Their investment preferences naturally differ from those of active business angels: potential angels articulate a preference for later financing phases and both latent and virgin angels primarily include direct investments in their investment calculations for diversification reasons, i.e. portfolio aspects are very much to the fore. Virgin angels in particular are generally much younger and generally less wealthy than all other angel types. In terms of financial assets and start-up experience, for example, they rank well behind the entrepreneur angel. However, they have a fundamental willingness to provide direct investments for start-ups. Latent angels are a special phenomenon in that they are basically familiar with the procedure of an angel investment, but still shy away from regular direct investments. They are older than virgin angels and younger than entrepreneur angels.

III. ENTREPRENEURSHIP EDUCATION & CO-EVOLUTION

Business angels have generally experienced a strong entrepreneurial orientation as part of their professional biography and may also have undergone processes of entrepreneurship education. Thus, entrepreneurial learning appears to be of great importance for the development of a specialisation of investors geared towards early-stage financing, even if the entrepreneurial experience must be transferred into an investor profile. This is the prerequisite for successfully dealing with particularly complex and genuinely uncertain decision-making situations [9].

In the context of teaching and training formats, for example, a combination of concepts for knowledge transfer and action orientation has proven to be effective in bringing the diversity and heterogeneity of knowledge, creativity and other potential to light and facilitating the discourse of shared learning. In addition to the integration of practitioners, who often act as role models and offer an inspiring exchange of experience, the problem-based learning approach, for example, has become established. Here, teachers and course instructors provide content input in the initial course phase and then increasingly take on the moderating and supporting role of a learning coach as the training programme progresses. In the age of digitalisation and artificial intelligence, knowledge is in principle immediately available anyway and routine questions are answered spontaneously without the

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intervention of a teacher. Within the framework of formats for strengthening the skills of individuals and smaller teams, very dialogical concepts for the initialisation of solution-oriented action have also developed, which operate at the interface of knowledge transfer (consulting), assistance for self-help (coaching) and the exemplification of solution orientation in concrete action situations (mentoring).

The development of entrepreneurial energy at the competence and motivation level can be described as a process of evolutionary learning that is self-created (autopoietic). This new entrepreneurial energy allows the learner more system states and ensures proactive, constructive handling of high environmental complexity. This is based on the "Law of Variety": only variety (intrinsic complexity) can master variety (environmental complexity) [10]. This is particularly relevant for companies with high growth ambitions (start-ups), as the aim here is to enable effective, coordinated teamwork in a strategic and operational context for rapidly growing team structures [11].

In the context of entrepreneurship, Röpke has worked out on the basis of systems theory arguments that entrepreneurial action can be causally derived from an interplay of the action variables "rights to act" (permission), "competences" (ability) and "motivation to perform" (willingness) [12]. Entrepreneurial energy levels (competences, motivation) are developed reciprocally, i.e. co-evolutively through social interactions and transactions [13], when entrepreneurial responses are made to environmental challenges that are accompanied by an increase in the entrepreneurial energy level on four different learning levels. Therefore, a fundamental distinction can be made between traditional learning (learning levels 0 and 1) as a guide to static efficiency and evolutionary learning (learning levels 2 and 3) as aspects of dynamic efficiency [14].

In this view, interdisciplinary processes of systemic-evolutionary, constructivist self-learning at learning levels 2 and 3 move to the centre of entrepreneurship education. While learning level 0 represents entrepreneurial routine on a generally unconscious level and learning 1 is aimed at absorbing new knowledge and building resilience in the course of past experiences, evolutionary learning (learning levels 2 and 3) is strongly based on the active functioning of the entrepreneurial perceptual apparatus. In reality, the linking of the learning levels is probably rather chaotic and very individualistic, especially as aspects of incremental knowledge absorption through effectual principles or pivoting in lean start-ups (learning level 1) can of course also lead to the strengthening of implementation and reflection energy at higher learning levels and vice versa. A strong vision, such as in the case of Bill Gates ("A personal computer on every desk and in every household"), unleashes forces and energy for the acquisition of implementation energy (learning level 2: communication with investors, effective time management, business modelling, etc.) and new specialist and market knowledge (learning level 1: new programming language, lean analytics, etc.). In a knowledge society, the comparative advantage is increasingly shifting from the level of specialist knowledge and qualifications (learning level 1) to the level of interdisciplinary implementation energy (learning level 2) and reflexive, visionary and energetic skills (learning level 3).

In order to consider the aspect of entrepreneurial energy on these evolutionary learning levels from a psychological perspective, it is worth pointing out the connection between motives (e.g. McClelland's achievement motive) as a guiding intention to act (learning level 3) and achievement motivation and volition as a form of willingness to act in a specific, challenging situation that requires courage, discipline and control of action (learning level 2). There appears to be a close connection between the development of competence and a favourable psychological disposition (see fig. 2).

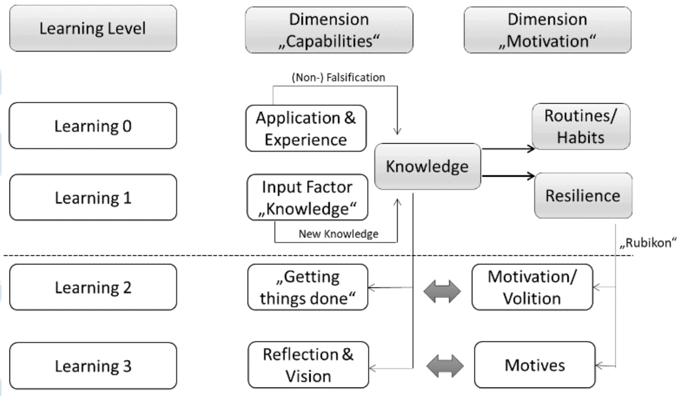

Fig. 2: Learning Level and Entrepreneurial Energy

The perception of the optimally effective, average level of challenge when assessing an action situation (convincing investors, setting up a branch, etc.) depends heavily on the underlying level of competence. Similarly, a courageous and committed approach to a challenge can remain fruitless without a corresponding level of competence and thus promote frustration rather than resilience. Research has also highlighted the aspect of "volition" as an aspect that must be taken into account in the context of realising an idea and constructively dealing with internal resistance (e.g. in the form of fear of failure, procrastination), i.e. when it comes to the proverbial crossing of the Rubicon [15].

IV. ANGEL LEARNING AT DIFFERENT LEVELS

In the context of early-stage financing of start-ups, it is particularly important for virgin angels to arm themselves for the uncertainties of a decision-making situation characterised by "true uncertainty" (Frank Knight) by building up expertise. Due to the changeability of processes and events, this also applies to all other types of angels, despite their experience from their professional biographies as entrepreneurs and angels.

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A. Angel learning at learning level 1 and 0

Let's start with the intuitively obvious learning level 1, which deals with experience and VC knowledge. A certain amount of knowledge about the basics and specifics of venture capital as a financial technology is required, on which the actions of potential and active angel investors can be based. For example, it is about understanding what VC is and how it differs from other forms of financing such as private equity and crowdfunding. It is also about distinguishing between different financing phases and raising awareness of the high failure rate of start-ups and the potentially high returns on successful investments. Only around 10% of all VC investments prove to be a so-called home run and generate at least ten times the invested capital on exit. This means that the total failures, underperformers or living deaths and average performers are cross-subsidised. In addition, an understanding of the methods used to value start-ups, e.g. through comparative analyses, discounted cash flow (DCF) or venture capital methods and the processes of due diligence to examine the business model, finances, legal structure, market, product and management team, must be internalised before an investment is made [16].

In addition to the many general legal aspects of business life in a VC case, there are some important legal aspects that primarily concern the term sheets and the investment agreement. Even if the actual drafting is later left to the lawyers and notaries, knowledge of the basics of a term sheet, including valuation, shares, liquidation preferences, anti-dilution and milestones, is necessary to conduct a contract negotiation. Furthermore, an understanding of various financial technologies, such as common stock, preferred stock and convertible debt, is required as they each constitute a specific legal status vis-à-vis the start-up. In connection with this, it is also useful to clarify typical shareholder agreements, as VC is typically associated with shareholder rights and VCs should therefore at least be aware of the relevance of typical clauses such as drag-along and tag-along rights, veto rights and information rights [17].

Furthermore, aspects of portfolio management and general economic activity are an essential part of a knowledge base for the VC business. This involves the basic principles of diversification, i.e. strategies for building a diversified investment portfolio to spread risk, an understanding of performance measurement using typical key figures such as internal rate of return (IRR) and multiple on invested capital (MOIC) and knowledge of possible exit strategies such as trade sales, secondary sales, buyouts and initial public offerings (IPOs). In addition, many aspects of market activity, such as network knowledge, trends and innovation cycles, are likely to be a useful addition to this knowledge base.

At learning level 0, the focus is on applying an investment strategy and comparing it with reality. At the very least, the classical venture capital cycle applies to everyday business: fundraising, investing, managing, exiting [18]. The aim is therefore to generate and screen a deal flow and evaluate promising start-ups with regard to a possible financing relationship. Portfolio decisions must be made and existing portfolio companies must be supported and supervised in the form of regular meetings and shareholder meetings in order to prepare them for exit decisions in the future. Whether and to what extent this takes place within the framework of syndication and in what way the action practice is then coloured in a type-appropriate way ultimately results from the impulses of the higher learning levels. Inexperienced angels in particular like to make use of the co-evolutionary function in the angel network for their first steps into practice. Syndicates serve as incubators, so to speak. Ambitious but still hesitant young angels learn to negotiate and diversify, to experience the world of the financial entrepreneurial innovation function, according to "after speaking with investors who have experience co-investing with other investors might actually be the very best way for novice as 'virgin angels' investors to enter the informal capital market, for they learn valuable skills from more experienced investors. They can glean more than just lessons about how to invest; they can learn how to be more actively involved in their portfolio companies" [19]. Of course, inexperienced angels cannot rely on syndication with a lead investor being a sure-fire success, as the social relationship with other angels - also in view of the competition between them - is also characterised by imponderables in the form of information asymmetries. Furthermore, co-operation with experienced investors may also leads to illusions of control, as experienced investors can also be susceptible to availability heuristics. Decisions by experienced angels are often strongly based on intuition and therefore lead to automated processes. In addition, the availability heuristic can lead to angels [20].

For potential and experienced angel investors, however, investment controlling also plays a major role in manifesting evidence-based learning at learning levels 0 and 1. It includes both the evaluation of the performance of the individual start-up and the performance of the entire portfolio. Both qualitative and quantitative aspects are considered. Typical aspects of investment controlling include reviewing the start-up's financial reports, including the income statement, balance sheet and cash flow statement, as well as measuring performance by analysing business development using key performance indicators (KPIs) and other metrics. It also involves identifying and monitoring risks associated with each investment and developing risk mitigation strategies. With regard to the relevant KPIs for start-ups, monthly reports are used, for example, to analyse the growth rate of sales and the cash burn rate, also in order to get a feel for the "cash runway" indicator. In addition, EBITDA is an indicator of operational performance. The Customer Acquisition Cost (CAC) indicator is used to determine the costs that have to be incurred to acquire a customer and the Lifetime Value (LTV) indicator is used to estimate the revenue that a customer will generate over the course of their lifetime. Other operational key figures are the churn rate (rate at which customers leave the product or service), the conversion rate (percentage of users who carry out a desired action), the monthly recurring revenue (MRR) and annual recurring revenue (ARR) [21].

In contrast, key figures must be established for the angel investor's portfolio development in order to enable target/actual comparisons between the angel investor's objectives and actual performance. Portfolio diversification measures the spread of investments across different sectors and stages of development, while the internal rate of return (IRR) measures the annual return that an angel investor generates from the entire portfolio. Other key figures include the multiple on invested capital (MOIC) as the ratio of the current value of the investment to the capital employed, as well as the ratio of exits to investments, the follow-on investment rate or the deal flow. Angel investors generally monitor these key figures continuously in order to assess the development of their investments and the overall portfolio. Typically, most of these key figures are already known due to the employment history of angels; if necessary, they should be internalised at learning level 1. It is also important that they are in close communication with the start-ups in order to obtain the necessary data promptly and correctly. These aspects make it necessary to address learning levels 2 and 3 in parallel in order to enable effective investor behaviour.

B. Angel learning at lerning level 3 and 2

At learning level 3, the typical questions of normative, strategic and operational management for today's and tomorrow's angel existence must be reflected upon in order to draw conclusions for the acquisition of implementation skills, specialist knowledge and application routines at learning levels 2, 1 and 0. From a normative point of view, the typical question of how to categorise one's own status quo and what image of the future one is striving for should be asked first. On this basis, a decision must also be made as to which legal form and with which partners the angel business should be established. Therefore, potential and experienced angels need to deepen their understanding of themselves as investors with a self-image. By continuously reflecting and analysing their strengths and weaknesses, they begin to take their socio-demographic characteristics - such as age, wealth and experience - into account for their strategic and operational orientation as angels and thus reflect on their influence on investment decisions. Behind this is a self-reflective, internal dialogue: Am I today an angel of the Godfather, Peer or Daddy Warbuck type (to use Gaston's typologisation)? What role model and need can and do I want to take from the perspective of start-ups, using Coveney and Moore's categorisation? Entrepreneur Angel, Corporate Angel, Latent Angel or Virgin Angel? In view of these two categorisations, which type would I like to aspire to in the future and which real business angels serve as role models for me in order to underpin the imaginary wishful thinking with a real image that serves as orientation? How can such role models be recruited as lead investors in a timely manner, for example, in order to develop learning impulses - also in co-evolutionary interaction with start-ups - at all learning levels within the framework of syndication? – Angels must therefore create orientation models for themselves, e.g. by observing lead investors in syndications in order to develop a frame of reference for their own investment approach. This type of thinking in terms of role model categories (and the associated media resonance) appears to play an important role in the context of promoting female entrepreneurs and angels.

Learning level 3 therefore also includes the development of an awareness of the role model, the individual goals and the strategic and operational portfolio management derived from this. There are also questions for self-reflection: What are the long-term and short-term goals and what resources are required to achieve them? How can the company's own resources in the form of the 3 Cs (capital, competence, contacts) be utilised to enable added value and a "skin in the game"? How can the asset class "start-ups" be integrated into your own portfolio strategy and life planning? In this context, to what extent do inquiring start-up players fulfil the objective and personal criteria for a long-term collaboration geared towards growth and exit? - In addition to proving certain, sometimes very individualised principles of success, learning from mistakes is also important. Critical rationalists such as Karl Popper and Hans Albert have repeatedly emphasised this evolutionary process of increasing knowledge. The proving of business models and specific competitive hypotheses is regularly accompanied by the occurrence and evaluation of statistical errors of the first and second kind, which can often be the result of cognitive distortions. In statistics, the first type error (also called alpha error) and the second type error (beta error) refer to the erroneous rejection of a true null hypothesis or the erroneous acceptance of a false null hypothesis. In the world of angel investing, this can be applied to investment decisions in order to develop a feeling for the occurrence and handling of such errors as part of training, coaching or mentoring, for example. The alpha error is a mistaken rejection of a good investment opportunity. For example, an angel investor decides not to invest in a start-up that is later very successful. The investor misses the opportunity to share in the success and realise a high return. The second beta error is a mistaken investment in a poor start-up. The angel investor invests in a start-up that is not successful, even though there were many red flags indicating problems. There is a risk of losing the invested capital and tying up resources in an unsuccessful company (so-called living dead). Only by precisely analysing the failure can a distorted view of representativeness, for example, be prevented. Against the background of systemic considerations, it can be assumed that the view of entrepreneurs and angel investors with regard to value creation and entrepreneurial business opportunities (and thus also the assessment of first and second type failures) is strongly subject-dependent.

The relationship between past and future investment decisions plays an important role, as angels who have ignored profitable investment opportunities (alpha error) show a certain degree of regret and tend to approach similar opportunities differently in the future [22]. Herd behaviour can also be associated with the "FOMO" (Fear Of Missing Out) phenomenon [23]. If the majority of all VCs are increasingly investing in one sector, there may be a feeling that they are missing out if they do not invest in this sector. This is also linked to the issue of reputation: if an investor makes a decision contrary to that of a larger group and this subsequently turns out to be wrong, this could result in damage to their own reputation. Adjustment heuristics should also be mentioned here, as anchor points are not uncommon for VCs. Often, certain investment criteria (location, industry, etc.) must be met for them to consider financing. If a start-up does not fulfil these criteria, it is sorted out in advance. On the one hand, this decision-making tool helps investors to decide whether it is worth the time to carry out a more detailed assessment. On the other hand, essential information that could indicate a profitable start-up is not taken into account [24].

In a more detailed analysis, there are strategies for identifying certain biases. For example, if a bias is suspected, triggered by the representativeness heuristic, it is possible to take a closer look at the conditional probabilities [25]. The conditional probability indicates how likely event A is for a given occurrence of event B. Identifications of the availability heuristic are possible, for example, through more in-depth information research and a subsequent comparison with current or perceived news or headlines. Questioning is also a solution for identification when the anchor effect is suspected [26]. However, without a corresponding awareness, no suspicion, whether founded or unfounded, can arise and ergo no enquiry can be attempted.

The use of information technology tools can also be used to raise awareness. The well-known 'Decision Journal', for example, can be used as an instrument for self-reflection, in which angels not only record investment decisions, but also their personal reactions and thoughts on these decisions. The well-known 'Harvard's Project Implicit' also makes it possible to become aware of one's own prejudices, which leads to a more objective view of start-ups. This makes it possible to overcome the signals from the world of experience (learning levels 0 and 1) from the perspective of possible cognitive biases such as the representativeness heuristic or the loss or regret aversion, which could cloud the results as errors of the first and second kind. One example of this is dealing with the famous FOMO problem.

In addition to utilising traditional coaching or training measures, angels could also make use of chatbots here, as ChatGPT can be integrated as an interactive reflection tool on the basis of effective prompting. AI can then be used to structure thought processes and shape the perspective of considerations. This can demonstrably help to develop a more reflective and less biased approach in one's role as an angel investor. Furthermore, various research results illustrate the extent to which newer artificial intelligence technologies could support start-up investors. For example, it was shown how powerful today's algorithms can be. A comparison of the investment returns of 255 angels with those of an AI algorithm shows that the performance of the algorithm exceeded the returns of the BAs on average. The only investors who performed better were those who had an extremely high level of experience and were able to suppress the effects of cognitive biases [27]. However, this technology can certainly be used to support decision-making and mitigate bias. In particular, as an analysis tool for studies in which no emotional elements come into play, such models can save time for start-up investors [28].

The cognitive apparatus is thus stimulated to avoid illusions of control and to deal with conditional probabilities reflexively and constructively in order to take precautions at learning levels 2, 1 and 0. In this context, it should also be taken into account that the cognitive and motivational basis of the investment decision also changes over time, particularly with regard to risk appetite or aversion. It is known that VC companies have moved away from early-stage financing as fiduciary financing and the associated regulatory and organisational requirements have increased (also as a result of tax policy benefits). Instead, they have specialised in the financing of later financing phases on a transactional and co-evolutionary basis. This can be described (using a term from foreign trade theory) as the "Dutch disease in financial intermediation" [29]. What conclusions can be drawn by successful business angels who have previously operated under the radar of financial supervision in the context of syndications and are now increasingly receiving requests from their personal and business environment to receive their financial resources in a fund? Question occurs then as to the underlying motives: Which key motives are then at work? How do achievement motivation, intrinsic motivation and the profit motive interact? - Research has shown that angels, as investors who are only responsible for themselves, do not place the profit motive in the foreground. Almost all studies indicate that the profitability of the investment is a rather insignificant factor when viewed in isolation. Rather, the return motive represents a hygiene factor and/or an indicator for monitoring the success of entrepreneurial action in the sense of Schumpeter and McClelland [30].

Learning level 2 is about developing implementation skills in order to pursue the objective as effectively as possible. Experienced and seasoned business angels know from their professional biographies that the complexity of angel investing - similar to the actions of a start-up entrepreneur - requires special competences at learning level 2 in order to establish "structural links" to the right players in the value creation process of the financing rounds.

Well-known questions about the problem of trust in the context of early-stage financing arise due to the insufficient

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information base, which would be really meaningful as trust signals. Agency risks remain wherever you look: Is the self-declared entrepreneur angel what he promises for joint syndication, or a narcissistic blowhard and therefore not a good trailblazer? Is the start-up really the self-declared new "AirBNB for pets" or a new case of "Theranos"? Of course, track record, traction, bootstrapping etc. can be used, but the matter remains imponderable. As a rule, the angel does not have to raise capital from outside and adhere to financial intermediary guidelines. However, he can and must fall back on alliances and syndicates for further financing rounds and seek structural links to financial intermediaries, whose credit and investment eligibility checks are simplified by the sponsorship of an experienced angel. The same applies to the implementation of his portfolio strategy: the business angel does not have to take into account the investment guidelines imposed on a fund manager by the legislator and his sponsoring organisation. They can diversify their financial assets and invest how, when and where they want. Nevertheless, an angel must establish specific communication patterns with those start-up companies that correspond to his orientation and convince them of his potential added value.

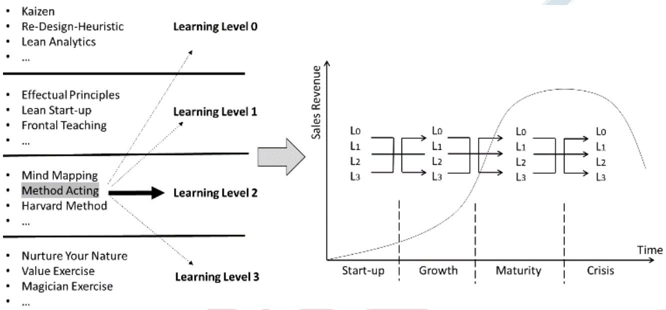

Fig. 3: Methods, Learning Level and Angel Life Cycle

Learning level 2 therefore includes, for example, an effective training on communication strategies and creativity in understanding and developing the start-up and its business model. This can be achieved, for example, through the use of "method acting" methods or techniques in the training of angels in strengthen the dynamics of their life cycle (see fig. 3) [31].

Communication is the key instrument and must be varied depending on the type of start-up - technically orientated companies may need to place more emphasis on data-based discussions, while creative ventures may need to have more visionary and future-oriented conversations. The reflection impulses of learning level 3 are of great importance here in order to effectively enable the transactional interaction of the roles. Inter-generational reflections (again at learning level 3) certainly also play a role here, as the psycho-social closeness of the relationship between angel investor and start-up team can also depend on the age difference, which sometimes determines the type of cooperation. Peer Angels, Very Hungry Angels or Fulltime Angels may have the qualities that characterise them as co-creators and co-entrepreneurs. There is perhaps a fit here between the competence and requirement profile of the contracting parties, also in the course of a certain self-similarity as a psycho-social attractor. The Godfather Angel or Daddy Warbuck types are more likely to fulfil the role of a coach, advisor or mentor due to the age difference and the associated specifics that arise for the mutual understanding of the system and thus for the social relationship with the start-up. In any case, know-it-all behaviour often proves to be a trigger for reactance, the perception of a restriction of autonomy and interference in causal attribution during the initiation of a contract or during the financing relationship. Similar aspects can also be mentioned for the external presentation: Should a pro-active communication strategy via social media channels be chosen or an existence as an "invisble angel" that relies on reputation effects? The answers to such questions are also derived from learning level 3. And in all of this, it is also important to emphasise the entrepreneurial element as a link to understanding successful early-stage collaboration [32]. Aernoudt states in this context: "It is worth noting that they never consider themselves as ex-entrepreneurs, but still as entrepreneurs" [33].

Business angels in particular could take advantage of structured coaching and mentoring programmes that support both start-ups and themselves in the learning process in order to focus on the specific issues of dealing with future portfolio companies and exercising a reflective understanding of their role. Methods of entrepreneurship education, such as method acting, can then be combined with specific methods for investors, such as reverse pitching, which is now more common. This makes it possible to look at the business models of start-ups from a new perspective and at the same time sharpen one's own persuasive skills. In addition to the structural links to the start-up and investor sphere, it is also necessary to continuously build and expand networks, i.e. the multidimensional expansion of structural links, also in order to keep working with experts (e.g. on trend topics such as sustainability, digitalisation) and possible cooperation partners who support progress in the angel existence. It is therefore also about developing skills in relationship management and building trust and reputation.

In addition, time management plays a crucial role in prioritising. With an increasing deal flow (and the associated negotiation requirements) and a growing portfolio size, business angels need to balance availability to strategically support start-ups without overstretching their own resources. Digital tools now help to organise the schedule efficiently and set up time blocks for intensive work phases, especially for the lengthy due diligence of new investments. If angels are not familiar with these tools from their own experience, then this would be an effective lever (alongside classic time management methods such as the Eisenhower method) to strengthen the effectiveness of assertiveness. It is always about harmonising the desirable and the implementation, i.e. psychologically the attitude and the behaviour, otherwise a

Virgin Angel will always remain virgin or a Latent Angel inactive because the proverbial Rubicon is not crossed due to a lack of motivation and volition. The associated insights of the evidence-based approach (learning levels 0 and 1) are then not incorporated into the reflection and implementation activities to sharpen and strengthen the motives for action, understanding of roles and resilience.

V. VENTURE CAPITAL IN TEACHING

There are now a number of initiatives dedicated to the qualification of VCs through training programmes and teaching units. In addition to the Kauffmann Foundation [34] and various angel academies, there are also further education and training programmes from the tertiary education sector, with universities also offering examination services and the acquisition of credit points as part of certificate programmes. This is intended to improve the awareness and skills of business angels in relation to the investment process [35].

Taking the previous comments on entrepreneurial learning into account, it becomes clear that such training programmes should provide fundamental stimuli for the stimulation of all four learning levels. Recognising that building awareness of cognitive and emotional biases is an essential part of dealing with mistakes that occur, it is necessary to address approaches that take into account young, inexperienced Anges as well as experienced business angels. Creating such awareness early on can protect against future negative influences. Such angel academies also bring angels together and give them the opportunity to exchange experiences or even venture investments together. Didactic measures can be helpful in giving potential angels a better understanding of business processes or finances of this kind.

Programme directors could - following the criteria of action-oriented concepts in entrepreneurship education (see chapter III) - consider the following:

- The current challenges and trends in the field of science and entrepreneurship.
- The basics of VC, including definitions and key concepts such as company valuation, term sheets and capital structure.
- The basics of investment strategies, including portfolio construction, risk assessment and management, and timing and exit strategies.
- The specific areas of expertise in which the VC would like to improve (e.g. technical understanding, market assessment, due diligence, networking).
- The inclusion of case studies of successful VCs investments.
- Workshops, pitch events, boot camps and simulation exercises for interactive training elements.
- An item on building and maintaining a network.
- A teaching unit on analysing and evaluating start-ups, including the creation of financial models, the assessment of business plans and the analysis of market opportunities.
- An interactive workshop in which participants can evaluate real pitch presentations by founders and provide feedback.
- Peer review sessions, in which participants give each other feedback on their investment analyses and decisions.
- A learning unit on critical thinking and judgement that focuses on recognising and avoiding cognitive biases and heuristics. Tools such as 'Farnam Street Decision Journal' or 'Implicit Association Tests (IAT)" of the Harvard Project Implicit can be used for this purpose.
- Methods of skills development (formal training, mentoring programmes, practical experience or case study analysis).
- A mentoring programme, which brings the virgin angel together with experienced investors to enable first-hand learning.
- An unit on negotiation and deal structuring, including case studies and role plays.
- Sessions regarding evaluation and reflection on the exercises carried out and the content learnt, including an action plan for the next steps.
- A final project that would require participants to apply all the skills they have learnt, such as preparing an investment proposal or carrying out a simulated due diligence audit.

In organisational terms, such a programme would have to take a number of specific features into account:

- Web-based modules and exercises, which are activated at the beginning of each week and form the basis for the units.
- Regular self-assessments and feedback sessions to monitor personal progress and adjust learning objectives.
- A combination of live online seminars, interactive modules, and real-life investment scenarios integrated into a specialised learning platform.
- An online orientation phase in which participants are familiarised with the course structure, the learning objectives and the platform used.
- The use of learning diaries in which participants record their daily findings and progress. These diaries are the basis, for example as a basis for awarding credit points.
- Implementation of a self-evaluation tool (e.g. Skillometer) that is specifically designed to measure progress in terms of investor competences.

Curriculum for a blended learning course:
"Developing investor competence for early-stage venture capitalists"
3 weeks, 48 hours of classroom training, 20-24 hours of follow-up mentoring

Module 1: Theory and self-awareness (1st week)
Day 1-2: Introduction to venture capital. Teaching the basics of venture capital and early-stage financing.
Day 3: Cognitive biases and self-perception. Explaining common cognitive biases and conducting online self-assessment tests.
Day 4-5: Fundamentals of start-up valuation Insight into qualitative and quantitative methods of company valuation.

Module 2: Case studies & simulation exercises (2nd week)
Day 1-3: Intensive case study work. Analysis of real case studies with 50:50 weighting of qualitative and quantitative aspects.
Day 4-5: Simulated investment rounds. Role plays and simulated investment sessions with feedback from mentors.

Module 3: Strategy development and networking (3rd week)
Day 1-2: Development of the investment strategy. Participants develop their individual investment strategies with the support of mentors.
Day 3-4: Networking events and pitch sessions. Direct interaction with start-ups in the region, discussion rounds and pitch analyses.
Day 5: Presentation and peer feedback. Participants present their investment strategies and receive peer feedback.

Learning diary (possibly also as a form of examination to earn credit points) and self-evaluation tool
Participants receive a template for the learning diary, which they keep weekly to document reflections and insights from each module, e.g. in an application context. An online self-evaluation tool is provided to enable participants to track and measure their learning progress.

Fig. 4: Curriculum "Developing Investor Competence"

The example of a curriculum in fig. 4 contains a comprehensive training programme for angel investors that combines theoretical foundations with practical experience and prepares them for success through continuous self-evaluation and professional mentoring. The academic learning level programme has been dispensed with in order to avoid potential deterrence or reactance. The starting point was a typical teaching format of 48 teaching units spread over three weeks. This is associated with a typical certificate scope, which can award separate credit points for each of the three modules. In order to intensify the necessary practical relevance, a 20-24 hour follow-up mentoring/coaching session after completion of the programme would be useful to raise awareness of practical issues in the context of individual sessions, group workshops and further networking opportunities.

VI. CONCLUSIONS

"Business angels: should they fly on their own wings?" asks Aernoudt (1999) in a remarkable essay directed against input-logic funding initiatives. The preceding remarks have shown that, from a systemic perspective, investor behaviour can be influenced by evolutionary learning and competence building. Of course, tax incentives certainly also play a role in influencing the risk appetite of VC investors. This may work in terms of volume, but the business angel phenomenon is not so much fuelled by the quantity of capital, but rather by the underlying financial entrepreneurial quality of operating successfully and sustainably in the seed and start-up segment. Trying to lure a Virgin Angel with money in order to steer his diversification decisions in the direction of Schumpeter financing is more like the image of a gardener trying to accelerate growth by vigorously pulling on budding blades of grass. "At the outset, it must be clear that business angels do not need money. The fact that they have money make them business angels" [36]. However, by working intensively on different learning levels business angels creates a solid foundation for their basic skills, investment activities. They become an expert in making the best use of their time and communication skills while developing a profound awareness of the psychological aspects of investing, which ultimately leads to an increase in investment quality and a robust, diverse portfolio.

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