

**A Critical Review of the Effects of
Entrepreneurship Trainings in Developing Countries**

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ABSTRACT

The published literature suggests that entrepreneurship training is an effective means of promoting entrepreneurship. The present study reviews 30 published and unpublished studies that evaluated 10 different entrepreneurship training programs in developing countries. The review indicates that entrepreneurship training seems to positively affect entrepreneurial performance. Moreover, it suggests that different training content may influence different facets of business success. However, the vast majority of the reviewed evaluation studies face serious methodological problems, thus limiting the conclusiveness of their results. Only two studies used sound methodologies. Hence, the present review stresses that it is essential to apply sound methodology to evaluate entrepreneurship trainings. Otherwise the results of the training programs could be spurious.

A Critical Review of the Effects
of Entrepreneurship Trainings in Developing Countries

INTRODUCTION

Agreement persists amongst scholars that entrepreneurship is of fundamental importance for the economy as it functions as a catalyst for innovation, job creation and economic well-being. Scientific evidence for this relationship has accumulated over time (e.g. Baumol, 2002; Birch, 1987; van Stel, 2006). Entrepreneurship is of particular importance for developing countries because with its inherent economic potential, it is an effective means of fighting poverty and unemployment (Mead & Liedholm, 1998). Thus, great effort is put into the promotion of entrepreneurship in developing countries. A frequently used approach is the development, implementation, and distribution of entrepreneurship training programs (Martinez et al., 2010).

But do these training programs indeed promote entrepreneurship? Harper and Finnegan (1998) addressed this question in their review of educational entrepreneurship interventions. The review indicated that entrepreneurship training seemed to have positive effects on entrepreneurial success. However, Harper and Finnegan came to the conclusion that the majority of the reviewed evaluation studies suffered from various methodological problems.

With the present review, we aim to build upon and to expand Harper and Finnegan's study. During the last decade that lies between Harper and Finnegan's review and today the interest in entrepreneurship has grown immensely and new entrepreneurship training programs have been developed and implemented. The number of scientific studies published in the field of entrepreneurship research has increased. This raises hope that the evaluation studies published within the last decade may have used stronger methodological designs. In the present review, we included all available studies evaluating entrepreneurship training

programs that involve psychological factors and that were conducted in developing countries. In all, we reviewed 30 studies on 10 training programs.

With the present research, we attempt to: 1) **assess studies which evaluate training programs to determine whether the methodologies used were adequate and therefore, efficacy of the training programs is supported;** 2) assess whether the evaluated training programs promote entrepreneurship; 3) determine, how the different contents of the training programs (psychological factors, business management skills) contribute to entrepreneurial success.

1. METHODS

We reviewed studies that evaluated training programs for entrepreneurs or would-be entrepreneurs. We included all types of entrepreneurship training programs that involve psychological factors: focused training interventions that solely concentrate on psychological factors, broadband trainings that combine strengthening of psychological factors with training of business management skills (e.g. business plan development, bookkeeping, or marketing) and hybrid forms that facilitate the access to assets in addition to training psychological factors.

To be included in this review, studies had to meet the following criteria: 1) they were conducted in developing countries; 2) they were published in English; 3) they reported quantitative data, pure case studies were excluded. Studies were identified from database search in PsychINFO, EBSCO, Social Sciences Citation Index (SSCI), American Economic Association's electronic bibliography of economic literature (EconLit) and Education Researches Information Index (ERIC), from internet search via Google and Google Scholar, from consulting the reference list of identified studies and from contacting the first authors,

colleagues and consultants who engage in the same field of research and organizations that promote entrepreneurship training in developing countries.

A total of 30 studies were identified that met the above listed criteria for inclusion in this review. Table 2.1 presents all 30 evaluation studies. Entries in the table are arranged according to the evaluated training program and according to a rating of the methodology used in the study. The higher the rating of a study, the more conclusive are its results (for composition of the rating see table 2.3).

Table 2.1 Summary of the identified evaluation studies of entrepreneurship training programs

Training/study	Purpose of evaluation	Methodology rating	Sample	Comparison group	Measurement wave	Instruments and outcome measures	Central results
AMT – Achievement Motivation Training							
McClelland & Winter (1969) Experiment, published	Impact assessment. Testing if increase in achievement motivation causes increase in success	****	151 entrepreneurs and would-be entrepreneurs from two different towns were invited to AMT. Those who participated formed TG (N=78), the others the (non-random, self-selected) CG (N=38). A second, matched CG was formed (entrepreneurs from third town, N=35); <i>Country</i> : India	Two non-treatment	1 st : Before intervention 2 nd : Directly a.i. 3 rd : 1½ years a.i.	Interview, projective test. Success (obj.), behavior, need for achievement (both obj./subj.), reaction	TG showed significant improvement in all indicators of economic success and was more successful than CGs. Need for achievement increased. Increase of achievement motivation caused increase in success
Miron & McClelland (1979) Experiment, published	Comparing effectiveness of AMT with two training programs that combine AMT with business training. Comparing effects of AMT with those of business training.	****	Entrepreneurs and would-be entrepreneurs were invited to AMT. 186 participated (non-random, self-selected sample) and were assigned to the different training programs (matched groups, N=56); <i>Country</i> : innercity,	One receiving AMT + long business training; one receiving AMT + short business training	1 st : Before intervention 2 nd : 1-1½ years a.i.	Questionnaire, telephone interview. Success (obj.)	All training groups increased in success measures. The pure AMT group was superior to the group receiving AMT + short business training and less successful than the group receiving AMT + long business training. AMT affected business growth, business training affected creation of new ventures.
EDP – Entrepreneurship Development Program							
Awasthi & Sebastian (1996) Survey, published	Impact assessment	***	1,295 participants of EDPs (entrepreneurs, would-be entrepreneurs), randomly selected 2-6 years a.i. 67 (operating for at least 3 years) were compared with matched control group (N=67); <i>Country</i> : India	Matched non-treatment	1 st : 2-6 years a.i.	Interview. Success (obj./subj.), reaction	TG was significantly higher than CG in financial performance
Patel (1981) Survey, published	Comparing effectiveness of adding EDP to two different financial support programs	***	94 participants (entrepreneurs, would-be entrepreneurs), randomly selected 1 year a.i. 24 participated in EDP; <i>Country</i> : India	One non-treatment; one financial support program for technicians; one financial support program for nonspecific target group	1 st : 1 year a.i. 2 nd : 2 years a.i.	Questionnaire. Success (obj.)	Entrepreneurs who received EDP in addition to financial support were higher in all success measures than entrepreneurs who solely received financial support. However, entrepreneurs of nontreatment group had higher Return of Investment than all training groups two years a.i.
Saini & Bhatia (1996) Survey, published	Impact assessment	**	74 participants (entrepreneurs, would-be entrepreneurs), invited 1-9 years a.i. to participate in the posttraining evaluation. 37 agreed (self-selected TG). 37 non-trained formed matched CG <i>Country</i> : India	Non-treatment	1 st : 1-9 years a.i.	Interview. Success (obj.)	TG was significantly higher than CG in two out of nine success measures

Note. TG = training group; CG = control group; N = number of participants; a.i. = after intervention; subj. = subjective; obj. = objective.

Training/study	Purpose of evaluation	Methodology rating	Sample	Comparison group	Measurement wave	Instruments and outcome measures	Central results
Harper & Mahajan (1995) - Study 1 - Survey, published	Impact assessment	*	60 participants, selected a.i. (process unknown). Matched CG was formed (N=60) <i>Country: India</i>	Matched non-treatment	Not reported	Instrument not reported. Success	TG was significantly higher than CG in some success measures
Harper & Mahajan (1995) - Study 2 - Survey, published		**	126 participants of different EDPs, selected 1-9 years a.i. 120 non-trained formed matched CG <i>Country: India</i>	Matched non-treatment	1 st : 1-9 years a.i.	Instrument not reported. Success (obj./subj.)	TG was significantly higher than CG in one success measure
SYB – Start Your Business							
Barwa (2003) Survey, unpublished	Impact assessment	**	258 participants (women entrepreneurs, would-be entrepreneurs), randomly selected 9 months a.i. <i>Country: Vietnam</i>	None	1 st : Nine months a.i.	Questionnaire. Success (obj./subj.), behavior (subj.), psychological factors (subj.), reaction	Vast majority reported positive change of success, behavior and self-confidence
Pharoah & Burton (2001) Survey, unpublished		**	45 participants (would-be entrepreneurs with business idea), randomly selected minimum two years a.i. <i>Country: South Africa</i>	None	1 st : Two years and more a.i., no upper limit	Interview. Success (obj.), reaction	Failure rate was 28%
Carlsson & Anh (2001) Survey, unpublished		*	648 participants (entrepreneurs, would-be entrepreneurs), randomly selected directly a.i.-three years a.i. <i>Country: Vietnam</i>	None	1 st : Directly a.i. - three years a.i.	Questionnaire. Success (obj./subj.), behavior (subj.), reaction	About 15% reported increase of success. Contradictory results for behavior
Abeyuriya (2005) Survey, unpublished		*	Two separate samples of participants (would-be entrepreneurs), randomly selected (first: N=97, ½-1½ years a.i.; second: N=?, 2½-3½ years a.i.; process unknown) <i>Country: Sri Lanka</i>	None	First sample: ½-1½ years a.i. Second sample: 2½-3½ years a.i.	Interview. Success (obj./subj.), behavior (subj.), reaction	1 st sample: small positive effect on success 2 nd sample: higher positive effect on success
GYB – Generate Your Business Idea							
Abeyuriya (2005) Survey, unpublished	Impact assessment	*	Two separate samples of participants (would-be entrepreneurs), randomly selected (first: N=97, ½-1½ years a.i.; second: N=?, 2½-3½ years a.i.; process unknown) <i>Country: Sri Lanka</i>	None	First sample: ½-1½ years a.i. Second sample: 2½-3½ years a.i.	Interview. Success (obj./subj.), behavior (subj.), reaction	1 st sample: start-up rate 15% 2 nd sample: failure rate 13%.

Training/study	Purpose of evaluation	Methodology rating	Sample	Comparison group	Measurement wave	Instruments and outcome measures	Central results
CEFE - Competency-based Economies through Formation of Enterprise							
Pham (2002) Survey, unpublished	Impact assessment	*	Two random samples of participants (poor women entrepreneurs). 1 st : N=784, selected directly a.i.; 2 nd : N=336, selected 7 months a.i. <i>Country</i> : Vietnam	None	First sample: Directly a.i. Second sample: Seven months a.i.	Interview. Success, behavior, learning, reaction (all subj.)	2 nd sample: vast majority reported increase of income and use of acquired knowledge
Nguyen (2001) Survey, unpublished		*	106 participants (entrepreneurs, would-be entrepreneurs); randomly selected ½-4 years a.i. <i>Country</i> : Vietnam	None	1 st : ½-4 years a.i.	Interview. Success (obj./subj.), learning (subj.), reaction	Majority reported increase of success and gain in knowledge
Reichert et al. (2000) - Study 1 - Survey, unpublished		*	207 participants (entrepreneurs, would-be entrepreneurs); selected up to 4 years a.i. (process unknown) <i>Country</i> : Sri Lanka	None	1 st : 1-1½ years a.i. 2 nd : 4 years a.i.	Questionnaire. Success (obj./subj.), reaction	Majority increased in success
Reichert et al. (2000) - Study 2 - Survey, unpublished		*	40 participants (entrepreneurs); selected 1-3 years a.i. (process unknown) <i>Country</i> : Laos	None	1 st : Directly a.i. - 3 years a.i.	Questionnaire. Success (obj./subj.), behavior (subj.), reaction	Increase of success and improvement of business management skills
Reichert et al. (2000) - Study 3 - Survey, unpublished		*	132 participants (entrepreneurs); selected 6-9 months a.i. (process unknown) <i>Country</i> : Thailand	None	1 st : 6-9 months a.i.	Questionnaire. Success (subj.), behavior (subj.), reaction	Around 30% reported increase of success
Braun et al. (1995) Survey, unpublished	Impact assessment of different CEFE courses	*	Participants who returned questionnaire up to two years a.i. (non-random, self-selected sample). 122 from courses for would-be entrepreneurs, 198 from courses for operating entrepreneurs <i>Countries</i> : Vietnam, Philippines, Kenya, Brazil, Chile	None	1 st : Directly a.i. - 2 years a.i.	Questionnaire. Success (obj./subj.), behavior (subj.), reaction	CEFE course for would-be entrepreneurs: start-up rate: 32% Other courses: vast majority reported positive change of success and behavior

Training/study	Purpose of evaluation	Methodology rating	Sample	Comparison group	Measurement wave	Instruments and outcome measures	Central results
EMPRETEC - "Emprendedores Tecnologia" (entrepreneurs technology)							
Cooley (1991) Experiment, unpublished	Impact assessment and identifying factors responsible for training effects	*****	90 applicants (entrepreneurs, would-be entrepreneurs) were randomly assigned to TG/CG. TG members who missed training were re-assigned to CG (partly self-selected sample). TG/CG: N=45 <i>Country: Malawi</i>	Randomized non-treatment	1 st : Before intervention 2 nd : Two years a.i.	Interview, questionnaire. Success (obj.), behavior (subj.), reaction	TG was significantly higher than CG in some success measures. Change in psychological factors was only marginally significant. Predominantly, change in success was due to change in psychological factors
Lopez (1999) Experiment, unpublished	Impact assessment	***	64 entrepreneurs and would-be entrepreneurs; pre-selection (criteria: entrepreneurial competencies) <i>Country: Brazil</i>	None	1 st : Before intervention 2 nd : 6-7 months a.i.	Interview and questionnaire. Success (obj./subj.), behavior (subj.)	No significant increase in objective success measures. Vast majority changed behavior, 5 out of 10 trained psychological factors increased significantly
Ruffing & Fulvia (1999) - Study 1 - Survey, unpublished		*	810 preselected (criteria: motivation, competencies) participants (entrepreneurs, would-be entrepreneurs); selected up to 10 years a.i. (process unknown). Non-randomized CG was formed (size unknown) <i>Country: Uruguay</i>	One, not described	1: Directly a.i. - 10 years a.i.	Instrument not reported. Success (not specified)	TG increased in success, CG decreased
Ruffing & Fulvia (1999) - Study 2 - Survey, unpublished		*	692 preselected (criteria: motivation, competencies) participants (entrepreneurs, would-be entrepreneurs), randomly chosen 6-9 months a.i. <i>Country: Brazil</i>	None	1 st : ½-2 years a.i.	Instrument not reported. Success (obj.)	No failure in TG. Average failure rate of Brazilian entrepreneurs: 75%
SABRAE & IBQP-PR (2002), Survey, unpublished		***	1,445 participants (entrepreneurs), randomly chosen for assessing psychological factors. 408 provided additional data for economic assessment (partly self-selected sample). Brazilian non-trained entrepreneurs formed CG <i>Countries: Brazil</i>	Non-treatment	1 st : Before intervention 2 nd : Directly a.i. - 3 years a.i.	Questionnaire. Success (obj.), behavior (subj.)	No significant increase in psychological factors. TG increased stronger in success than CG (no significance testing)
EMPRETEC Ghana Foundation (1999)		Assessing impact of different services (training, financial/technical assistance, business plan)	*	93 entrepreneurs who provided enough data (self-selected sample); only 20% received training, 80% received other services <i>Countries: Ghana</i>	None	1 st : ? 2 nd : 1 year a.i. 3 rd : 2 years a.i.	Questionnaire. Success
EMPRETEC Ghana Foundation (2002)	financial/technical assistance, business plan)	*	24 entrepreneurs who provided enough data (self-selected sample); only 50% received training, 50% received other services <i>Countries: Ghana</i>	None	1 st : ? 2 nd : 1 year a.i. 3 rd : 2 years a.i.	Questionnaire. Success	Majority increased in success

Training/study	Purpose of evaluation	Methodology rating	Sample	Comparison group	Measurement wave	Instruments and outcome measures	Central results
Personal Initiative Training							
Glaub et al. (2009) Experiment, unpublished	Impact assessment. Testing if increase of personal initiative causes increase of success	*****	100 entrepreneurs;randomly assigned to TG (N=47) and waiting CG (N=53; trained after last measurement wave) <i>Country: Uganda</i>	Randomized non-treatment	1 st : Before intervention 2 nd : Directly a.i. 3 rd : 3-4 months a.i. 4 th : 1 year a.i.	Interview, questionnaire. Success, behavior (both obj./subj.), learning (obj.), reaction	TG increased significantly higher in success and personal initiative than CG. Increase of personal initiative caused increase of success
Glaub et al. (2004) Experiment, unpublished	Impact assessment	****	84 entrepreneurs were invited to participate. Those who denied or missed training formed CG (N=57). TG: N=27 (self-selected sample) <i>Country: South Africa</i>	Non-treatment	1 st : Before intervention 2 nd : Directly a.i. 3 rd : 5-7 months a.i. 4 th : 2 years a.i.	Interview, questionnaire. Success, behavior (both obj./subj.), learning (obj.), reaction	TG was significantly higher than CG in success 5-7 months a.i. No significance after 2 years. TG increased significantly higher in personal initiative compared with CG. Personal initiative partly caused increase of success
WEP – Women Entrepreneurship Programme							
Botha (2006) Experiment, published	Impact assessment	***	180 women (entrepreneurs, would-be entrepreneurs); preselected (criteria: growth potential). 116 were assigned to TG, 64 formed partly matched CG <i>Country: South Africa</i>	Partly-matched non-treatment	1 st : Before intervention 2 nd : Directly a.i. 3 rd : 6 months a.i.	Questionnaire. Success (obj./subj.), behavior, learning (both subj.), reaction	TG reported higher increase in success than CG. TG significantly increased in knowledge, psychological factors, behavior
CEPE - Création d'Entreprises et Développement de la Petite Entreprise							
Kouessi (1995) Survey, published	Impact assessment	*	31 participants (entrepreneurs, would-be entrepreneurs) who agreed to participate in evaluation; selected six months a.i. (nonrandom, self-selected sample) <i>Country: Senegal</i>	None	1 st : Nine months a.i.	Questionnaire. Success (obj./subj.), behavior (subj.), reaction	Nearly all reported change in behavior
TechnoServe Business Plan Competition							
Klinger & Schündeln (2007) Experiment, unpublished	Impact assessment and comparing the effects of business plan training with those of training psychological factors	****	Applicants (entrepreneurs, would-be entrepreneurs)submitted business idea; assignment to TG (N=377) and CG (N=278), criteria: high quality → TG (preselected, nonrandom sample) <i>Countries: Guatemala, Nicaragua, El Salvador</i>	Non-treatment	1 st : Before intervention 2 nd : One year a.i.	Questionnaire. Success (obj.)	TG showed 25% more business creation activity than CG. Training psychological factors significantly affected expansion, business plan training affected business start-up

2. RESULTS

The identified 30 studies evaluated 10 different training programs. Table 2.2 gives an overview of the 10 training programs.

Table 2.2 Identified entrepreneurship training programs

Training	Basic type (psychological training or business management skills or mixed)
AMT – Achievement Motivation Training	Psychological training
EDP – Entrepreneurship Development Program	Mixed
SYB – Start Your Business	Mixed
GYB – Generate Your Business Idea	Mixed
CEFE - Competency-based Economies through Formation of Enterprise	Mixed
EMPRETEC - Emprendedores Technologia	Mixed
Personal Initiative Training	Psychological training
WEP – Women Entrepreneurship Programme	Mixed
CEPE - Création d'Entreprises et Développement de la Petite Entreprise	Mixed
TechnoServe Business Plan Competition	Mixed

Did the reviewed studies use adequate methodologies and therefore, the results of the evaluated training programs are verified?

To assess the properness of the methodology used for evaluation, we rated eight methodological aspects from three categories that have an influence on the conclusiveness of a study's results. The first category "*sample*" consisted of the aspects *sample size* and *quality of sample*. The second category "*design and measures*" included *use of a control group*, *use of pre and post intervention data*, and *use of reliable, valid and objective measures*. The third category "*data analyses*" was formed of the aspects *use of analyses for significance testing* and whether *analyses met statistical conventions*. Each aspect was assessed separately by two independent raters. Both raters were scholars and experienced in developing and evaluating educational interventions. '++' was assigned when the manifestation of the methodological aspect didn't limit, '+' when it somewhat limited, and '0' when it did strongly limit the

conclusiveness of the results. ‘?’ was assigned when no information about the methodological aspect was provided. Two independent raters assessed each aspect. Both raters were scholars and experienced in developing and evaluating educational interventions. Interrater agreements were calculated with the two-way mixed effect model (people effect random, measure effect fixed, single measure correlation) of the intraclass correlation coefficient (Shrout and Fleiss, 1979). Interrater correlation was on average $r = .94$.

Table 2.3 presents the ratings of the different methodological aspects. For each study, a “methodology rating” was built by summing ratings across all aspects and by dividing the sum by three. In table 2.3, the methodology rating is provided as an absolute number and as a rounded value in form of asterisks. The highest possible rating was 5.3 (five asterisks).

Table 2.3 Methodology rating: Degree of properness of applied methodology

Training program		Achievement Motivation Training		Entrepreneurship Development Program				Start Your Business				GYB	CEFE			
Methodological aspect		McClelland (1969)	Miron (1979)	Awasthi (1998)	Patel (1981)	Saini (1996)	Harper (1995) Study 1	Harper (1995) Study 2	Barwa (2003)	Pharoah (2001)	Carlsson (2001)	Abey Suriya (2005) Study 1	Abey Suriya (2005) Study 2	Pham (2002)	Nguyen (2001)	Reichert (2000) Study 1
Sample	Sample Size > 20	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
	Quality of Sample	++	+	+	++	0	?	0	++	0	0	+	+	++	0	?
Design and measures	Use of Control Group	++	++	++	++	++	++	++	0	0	0	0	0	0	0	0
	Randomization of Control Group	0	0	+	0	0	0	0	0	0	0	0	0	0	0	0
	Use of pre and post Intervention Data	++	++	++	++	0	0	0	+	+	+	0	0	0	+	+
	Reliable, valid, objective measures	+	+	+	+	+	?	?	+	+	+	+	+	0	0	?
Data analyses	Use of Analyses for Significance Testing	++	++	+	0	++	++	0	0	0	0	0	0	0	0	0
	Analyses met statistical Conventions	0	+	0	0	0	?	0	0	0	0	0	0	0	0	0
Methodology rating*1 (min. = 0; max. = *****; highest possible rating 5.3)		**** (3.7)	**** (3.7)	*** (3.3)	*** (3.0)	** (2.3)	** (2.0)	* (1.3)	** (2.0)	* (1.3)	* (1.3)	* (1.3)	* (1.3)	* (1.3)	* (1.0)	* (1.0)

Training program		CEFE			EMPRETEC						Personal Initiative Training	WEP	CEPE	Techno Serve		
Methodological aspect		Reichert (2000) Study 2	Reichert (2000) Study 3	Braun (1995)	Cooley (1991)	Lopez (1999)	Ruffing (1999) Study 1	Ruffing (1999) Study 2	SABRAE (2002)	Ghana Found. (1999)	Ghana Found. (2002)	Glaub (2009)	Glaub (2004)	Botha (2006)	Kouessi (1995)	Klinger (2007)
Sample	Sample Size > 20	++	++	++	++	++	++	++	++	++	++	++	++	++	++	++
	Quality of Sample	?	?	0	++	0	0	+	+	0	0	++	+	+	+	+
Design and measures	Use of Control Group	0	0	0	++	0	++	0	++	0	0	++	++	++	0	++
	Randomization of Control Group	0	0	0	+	0	?	0	?	0	0	++	0	0	0	0
	Use of pre and post Intervention Data	+	?	+	++	++	?	0	+	?	?	++	++	++	0	++
	Reliable, valid, objective measures	?	?	0	++	++	?	?	+	+	+	++	+	?	0	+
Data analyses	Use of Analyses for Significance Testing	0	0	0	++	++	0	0	+	0	0	++	++	++	0	++
	Analyses met statistical Conventions	0	0	0	++	0	0	0	0	0	0	++	++	0	0	+
Methodology rating*1 (min. = 0; max. = *****; highest possible rating 5.3)		* (1.0)	* (0.7)	* (1.0)	***** (5.0)	*** (2.7)	* (1.3)	* (1.0)	*** (2.7)	* (1.0)	* (1.0)	***** (5.3)	***** (4.0)	*** (3.0)	* (1.0)	***** (3.7)

Note. "0" strongly limits conclusiveness of results; "+" somewhat limits conclusiveness of results; "++" no limitation of conclusiveness of results; "?" no information provided; *1 all "+" were sum up and divided by 3 (for better presentability).

The following section explains why and how each methodological aspect was rated and summarizes the results of the ratings.

Category “*sample*”: A larger *sample size* leads to increased precision in estimates of various properties of the population and thus, to a higher generalizability of the results. In all studies, the sample included more than 20 individuals for at least one point of measurement (ranging up to 1,362 individuals) and was rated with “2”. We assessed the *quality of the sample* according to the degree to which the selection of the sample had been biased. Selection bias is a statistical bias in which there is an error in choosing the individuals to take part in a study. Such a bias may lead to overestimation of the impact of a training program. The selection is biased, if the sample is self-selected (i.e. entrepreneurs have control over whether to participate in the study and participants' decision to participate correlates with traits that affect the study), if the sample suffers from attrition (e.g. participants who did not profit from a training lose interest in participating in posttraining assessment), or if there is pre-screening of participants (e.g. only entrepreneurs with high motivation were invited to take part in a training course). Frequently, the quality of the sample was low: 10 studies (33%) were assigned “0” indicating that a large selection bias negatively affected the conclusiveness of the studies' results. Only seven studies (23%) did not or only marginally suffer from a selection bias and were assigned “2”.

Category “*design and measures*”: The *use of a control group* allows controlling for effects of extraneous variables that could be alternate explanations of experimental results. For example, if participants' business success increases after participating in a training program the reason for this increase may be general economic growth and not participation in the training program. In this case, a control group would equally increase in business success. But if the training program had a positive effect on business success, the training group would show a higher increase than the control group. 16 studies (53%) did not use a control group

and were rated “0”. *Randomization of the control group* eliminates selection bias and reduces the probability that confounding variables influence the results. Only one study used a fully randomized control group and was assigned “2”, whereas 26 studies (87%) did not use a randomized control group (rating “0”). The *use of pre and post intervention data* enables to analyze the development of variables over time. We assigned “2” (33%), “1” (27%), “0” (27%) according to the amount of pretraining or posttraining data collected. The *validity, reliability and objectivity of the used measures* were assessed in terms of the amount of valid, reliable and objective measures used. Validity is the degree to which a test measures what it is supposed to measure; it is the accuracy of a measurement. Reliability is the extent to which a test measures the same way each time it is used under the same condition with the same subjects. Objectivity is the degree to which the results of a measurement are independent from the researcher. Frequently validity, reliability or objectivity was negatively affected. Only three studies (10%) were assigned “2”, 15 (50%) “1” and four “0” (13%).

Category “*data analyses*”: First, we assessed the amount of *analyses for significance testing used*. Analyses for significance testing are necessary to prove, if results are of statistical relevance or if they may have occurred by chance. 16 studies (60%) did not use any analyses for significance testing (rated “0”), two (7%) were rated “1” and 10 (33%) studies were assigned “2”. Second, we assessed if the used *analyses meet statistical conventions*. We assigned “2” when the analyses used allow for examination of alternative explanations of the observed results (e.g. multivariate techniques) and “1” if less statistically conclusive analyses were calculated (e.g. paired *t*-tests). Only three studies (10%) were assigned “2”, 25 studies (83%) did not use analyses that meet statistical conventions (rated “0”).

Summarizing Table 2.2, the majority of the studies received low scores on the methodology rating: 24 studies (80%) were given a total research methods rating of only one to three asterisks, indicating that the results of the studies are not conclusive and the results of

the evaluated training programs are not verified. Four studies (13%) received four asterisks, indicating that their results are somewhat conclusive but that they have to be interpreted with caution. Only two studies received five asterisks, indicating the presence of a proper evaluation design and methodology. These studies seem to provide valid and conclusive results.

Do the evaluated training programs promote entrepreneurship?

The last column of table 2.1 presents the main results of the reviewed studies. Across all studies, the 10 evaluated training interventions seemed to have positive effects on participants' knowledge, behavior and business success. However, because of the weak methodology of the majority of the studies, their results have to be interpreted carefully. The six studies that were given four or five asterisks in the methodology rating (Cooley, 1991; Glaub et al., 2010; Glaub et al., 2004; Klinger and Schündeln, 2007; McClelland and Winter, 1969; Miron and McClelland, 1979) and that were all field-experiments are more conclusive. All six studies showed that the evaluated training programs (Achievement Motivation Training, EMPRETEC, Personal Initiative Training, and TechnoServe Business Plan Competition) led to an increase in the trained psychological factors, in business management skills and in participants' business success. Three studies (Glaub et al., 2010 for the PIT; McClelland and Winter, 1969 for the AMT; Cooley, 1991 for EMPRETEC) showed that the increase of participants' business success was caused by a training-based increase of the trained psychological factors (mediation effect) and not by unspecific effects of training (e.g. increased motivation due to a charismatic trainer).

Summarizing the studies' results, it seems that entrepreneurship training positively affects entrepreneurial performance.

How do the different contents of the training programs contribute to entrepreneurial success?

Two of the reviewed studies give indications on how the different contents (psychological factors, business management skills) of the training programs contributed to entrepreneurial success. First, Klinger and Schündeln (2007) evaluated the TechnoServe Business Plan Competition that involved psychological factors and business plan development. They found that training psychological factors had a significant effect on business growth while the business plan component positively affected business start-up. Second, Miron and McClelland (1979) compared the effects of Achievement Motivation Training with the effects of training business management skills. While Achievement Motivation Training seemed to bring about business growth, the business management training was more important for establishing new ventures and resuscitating ailing businesses. Both studies suggest that while both, training of psychological factors and training of business management skills promote entrepreneurial success, they may actually influence different facets of success.

3. DISCUSSION

The present review includes 30 studies that evaluated 10 entrepreneurship training programs. With this contribution we expand Harper and Finnegan's (1998) review of educational entrepreneurship programs.

Overall, the methodologic quality of the 30 reviewed studies that evaluated 10 entrepreneurship training programs is still relatively weak: 16 studies (53%) obtained a methodology rating of 1.3 or lower. This means that they did not apply adequate methodology and that their results are not conclusive. Thus, it would be useful to improve the methodological designs of these studies. To develop clear conclusions about the impact of training programs the methodological design needs to exclude alternative explanations of outcomes; true experimental designs using randomized control groups are required. Only six out of 30 studies were field-experiments that collected data before

and after the training. Only two of these field-experiments scored five asterisks on the methodology rating, indicating that a proper evaluation design had been applied.

The reviewed studies suggest that entrepreneurship training programs seems to positively affect entrepreneurial performance. Especially the more conclusive field-experiments (with four or five asterisks on the methodology rating) support this conclusion. This finding is consistent with the results of Harper and Finnegan's (1998) review of selected entrepreneurship training programs.

Two studies (Klinger and Schündeln, 2007; Miron and McClelland, 1979) found that psychological training and business management training seemed to affect different facets of business success. While business management training promoted business start-up, training of psychological factors enhanced business growth. This suggests that the two types of training programs seem to vary in terms of effectiveness along the entrepreneurial process. The entrepreneurial process can be divided into three phases: a prelaunch, a launch and a postlaunch phase (Baron, 2007). Training business management skills seemed to have a stronger positive impact on the first two phases, whereas training psychological factors seemed to be more effective during the postlaunch phase. Business planning, for example, may be of particular significance in the prelaunch phase as it serves as an instrument of analysis, providing the entrepreneur with information about all kinds of requirements necessary to launch a profitable business. In addition, a business plan frequently is a prerequisite for receiving starting capital from financial institutions. During the postlaunch phase, high competition may lead to the requirement for continuous high-speed development (Baum, 2004; Eisenhardt, 1989). Thus, psychological factors such as motivation to stand out from competitors, to be innovative and to expand may get more essential. **However, much more research is needed to allow firmer conclusions on effective components related to phases of the entrepreneurial process.**

Limitations

Although we have done our best to identify all studies that evaluate entrepreneurship training programs, the number of reviewed studies is relatively small. It is likely that some pertinent evaluations escaped our attention (e.g. some studies were not available in English or some may have been conducted by local organizations or consultants and were never available). Given the fact, how important entrepreneurship training is for poverty reduction and the development of countries, it is surprising how few evaluation studies were done in this area.

The present review may suffer from publication bias. The majority of the evaluations are carried out or commissioned by program providers or implementers who may want their training program to appear successful and thus, may be more interested in publishing success stories rather than negative results. Therefore, studies that failed to find positive outcomes might not have been published and, thus, do not appear in any databases.

Implications and Direction for Future Research

The present review stresses the need for proper evaluation of entrepreneurship training programs. It shows that the majority of the identified entrepreneurship training programs have not yet been evaluated rigorously and thus, their effects have not yet been verified. This is surprising considering that these training programs may be widely distributed and implemented in different continents and attended annually by tens of thousands of entrepreneurs and would-be entrepreneurs.

We recommend that developers of entrepreneurship trainings carefully evaluate the impact of new training programs before implementing and distributing them. Valid results should provide some evidence that the benefits of the training programs outweigh the costs.

In the following, we provide some guidelines for conducting evaluation studies:

1) Sample: Try to get a sample as representative as possible for the population of the targeted individuals (e.g. for operating entrepreneurs of a certain country). Best is to choose participants randomly and to get a large sample.

2) Control group: You should use a nontrained control group and randomly assign participants to the control and the training group. To avoid attrition in the control group, you should guarantee the control group participation in the training course after your last measurement wave.

3) Measures and design: You should use valid, reliable, and objective measures. If you want to assess different aspects of training effectiveness, you may follow the recommendations by Kirkpatrick (1959) to evaluate participants' reaction towards the training (e.g. satisfaction), the change in knowledge and behavior and objective results (e.g. number of employees, sales level). You should collect data before (as baseline) and after the training in order to analyze training-related change. A second posttraining measurement enables you to examine, whether training effects stay stable over time. Don't use retrospective questions after the training to collect pretraining data. These data may be biased by problems of recall.

4) Statistical analyses: Use proper statistical analyses to prove, whether results are of statistical relevance or whether they just occurred by chance. You should use analyses that allow controlling for extraneous variables (e.g. ANCOVAs).

Even if conducting a study along these guidelines is difficult and requires great effort, the present review showed that such an evaluation is possible: Two studies were identified that received five asterisks on the methodology rating (Cooley, 1991; Glaub, 2009), indicating that a proper evaluation design had been applied.

We hope that this review will encourage scholars and practitioners to empirically evaluate the effectiveness of entrepreneurial training programs by using an adequate methodology and to thoroughly report the used methodology and the obtained results.

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