

El Salvador: Centre of Investigation and Transfer of Technology - CITT I and II

Ex post-evaluation report

OECD sector	Higher education/11420	
BMZ project number(s)	(1) 1992 65 943 (2) 1997 65 819	
Project executing agency	Institución Salesiana/Universidad Don Bosco	
Consultant	-	
Year of ex-post evaluation	2006	
	Project appraisal (planned)	Ex-post evaluation (actual)
Start of implementation	(1) 2nd quarter 1994 (2) 2nd quarter 1998	(1) 2nd quarter 1995 (2) 2nd quarter 1999
Period of implementation	(1) approx. 1.5 years (2) 2 years	(1) 2.5 years (2) 2.5 years
Investment costs:	(1) EUR 4.0 million (2) EUR 3.5 million	(1) EUR 6.5 million ¹ (2) EUR 3.5 million
Counterpart contribution	(1) EUR 0.7 million Institución Salesiana (2) EUR 0.9 million Institución Salesiana	(1) EUR 0.9 million Institución Salesiana, EUR 0.3 million Government (2) EUR 0.9 million Inst. Salesiana
Finance, of which FC funds	(1) EUR 3.3 million (2) EUR 2.6 million	(1) EUR 3.3 million FC, EUR 2.0 million Italian development aid and USAID (2) EUR 2.6 million
Other institutions/donors involved	(1) Italian development aid	(1) Italian development aid, USAID
Performance rating	3	
• Significance/Relevance	3	
• Effectiveness	3	
• Efficiency	4	

¹ Almost solely FC costs were estimated at project appraisal. Since the final inspection of CITT I, all costs incurred and their finance, as well as from other donors, have been included in the construction of CITT. This is the reason for the CITT I 'cost increase'.

Brief Description, Overall Objective and Project Objectives with Indicators

The projects comprised building and outfitting the **Centre of Investigation and Transfer of Technology (Centro de Investigaciones y Transferencia Tecnológica - CITT)** at the **University of Don Bosco (UDB)** run by the Salesian order in Soyapango. CITT is a laboratory complex and provides practical training for engineers and technicians. It also renders advisory and further training services to Salvadorian business and industry.

Project objectives: The two projects aimed at enabling engineering and technical students to acquire qualified and practical training. Furthermore, the CITT II project was intended to provide Salvadorian enterprises and public clients with services and further training to improve product quality.

Overall objectives: The CITT I project was intended as a contribution to raising productivity and quality in El Salvador's trades sector. The CITT II project was to help meet the training and consultancy needs of Salvadorian enterprises so as to raise their competitiveness on the globalized market through high-quality products. (See page 3 for the very detailed target indicators.)

Project Design/Major Deviations from Original Planning and Main Causes

To a very large extent, the measures in both projects were carried out as planned. They comprised the following elements:

CITT I: Erection of 3 two-storey buildings and a multipurpose building; outfitting of 3 laboratories for electrical engineering, 7 workshops or laboratories for electrical engineering and data processing, a service workshop, a laboratory for medical therapeutic and diagnostic technology and advice to the executing institution in setting up a management information system.

CITT II: Construction of a lecture-hall, a lecture hall building and an orthopaedic workshop, outfitting three laboratories (metrological and test laboratory, materials testing laboratory, scientific laboratory) as well as a library; outfitting of a laboratory and building with furnishings and fittings as well as consultancy services. In addition, CITT specialist staff in the new metrology and materials testing laboratories were to be trained.

Key Results of Impact Analysis and Performance Rating

The overall objective of CITT I was to be deemed as achieved if 80% of graduates found adequate employment as of 1996. This indicator has been met, but it is not valid as for one thing, the absolute number of graduates fell far short of expectations, and for another, employment need not be the result of increased productivity and quality. The overall objective of CITT II was deemed to have been achieved with the attainment of its project objectives. In hindsight, however, the overall objective is overambitious (with respect to globalisation) and not specific enough. A more exact definition of industries in need of technicians and engineers trained by the project or where most linkages could be made or of products and product groups that were really suitable for the world market would have made the project contribution at overall objective level more plainly ascertainable. In the present case, however, the connection between the overall and project objective level has not been coherently defined. However, to be able to arrive at a final assessment of overall objective achievement, demand by industry for graduates from the UDB and its services can serve as an approximate indicator. As vacancy notices in industry frequently explicitly call for a completed course of study at UDB as a qualification and services provided by CITT are in heavy demand, this indicator can be deemed to have been met. Partly due to the CITT and the resultant practical alignment of the courses of study, UDB is regarded as by far the best university in the country for technical and engineering subjects. Measured against this approximate indicator, the overall objective has been reached.

The project objective for CITT I was to be regarded as attained if at least 400 students (engineers and technicians) a year completed their studies as of 1998. The actual number falls well short of this indicator. The total number of graduates in all faculties at UDB amounted to 324 students in 2005, the number in the relevant fields of study to only 227. At the time of the

final inspection of CITT II (2001), this figure amounted to a mere 87, however. So the number of graduates has increased sharply in recent years. The original indicator was, however, based on overoptimistic estimates by the university. In retrospect, the executing agency argues that at the time of project appraisal for CITT I (1992) shortly after the 12-year civil war more young people were generally expected to study after the cessation of hostilities and the attendant insecurity. Owing to the poor quality of secondary education and economic obstacles for students these expectations proved to be unrealistic, however.

The project objectives achievement for CITT II was to be measured by the following five indicators:

Indicator 1: The departments in the engineering faculty are each staffed with 4 full-time personnel. This indicator had already been met at the time of the final inspection. In 2006, altogether 83 full-time teaching staff, evenly distributed, were working in the relevant departments and sections at CITT where courses in these subjects are conducted.

Indicator 2: Thirty per cent of teaching staff at CITT hold a postgraduate qualification as of 2001. Although it has risen steadily in recent years, the ratio of teaching staff at the university with post-graduate qualifications is still below the national average. This, however, is not a valid yardstick. According to the Salvadorian Ministry of Education, only Masters courses and PhDs count as postgraduate training. No such courses exist for most technical courses of study at the university, so that strictly speaking it is impossible for the teaching staff to undergo postgraduate training. The indicator was chosen at that time to guarantee the quality of teaching. UDB attaches great importance to upgrading its teaching staff and draws up individual continuing education plans for personnel. If we apply other advanced education courses than those specified by the ministry, therefore, 41% of all personnel at CITT have been trained in their special subjects through in-house and external courses. The indicator can therefore be considered to be met.

Indicator 3: Seventy per cent of the available study places at CITT have been allocated and are also used as of 2001. At the final inspection of CITT II (2001), only 60% of CITT capacity was in use. By adjusting the curricula to guarantee the best usage of CITT by all faculties, CITT's capacity utilization has now been raised to 86%. The indicator can therefore be regarded as met.

Indicator 4: At least 50% of the new students at CITT complete their engineering studies as of 2003. The graduation rate at the entire university amounted to 5.7% in 1997 (national average: 6%). It was 10% in 2001. At 10%, the rate at ex-post evaluation also equalled the national average for all universities. For the most part, the reasons for the high dropout rate have remained the same since the beginning of the project: First, many students lack the necessary basic knowledge in mathematics or science subjects and leave the university in the first two years despite a large number of supplementary refresher courses. Second, due to their precarious finances, the longer they study the more students are obliged to take up some form of employment, which is not conducive to a course of study. Most students at UDB come from very low-income to poor families and are therefore exposed to a higher dropout risk than students at other universities. The indicator has not been met. The target of 50% was, however, unrealistic. The reasons for the dropout rate are structural and for the most part beyond the influence of the university let alone the project. Without a significant improvement in secondary education standards and the economic situation of the students a rise in the graduation rate as high as originally planned is not feasible, particularly since it is very low nationwide. The university has taken all sorts of measures in the course of the project to reduce the exodus of students, including grants, a tutorial model, support courses, preparatory courses, in-service upgrading of teachers and very low student fees. This has resulted in a tangible rise in the absolute number of graduates but has failed to reduce the total dropout rate significantly so far. This why after the final assessment of CITT II the executing agency suggested a target of 200 annual graduates from the technical and engineering faculties as an alternative performance indicator to this indicator and the overall objective indicator for CITT I. We regard this as a legitimate proposal as it shows that the executing agency is trying to stem this exodus by the means at its disposal despite its limited ability to influence the external reasons for the small number of graduates. In the last three years, the absolute number of graduates has averaged

218. In 1997, this figure amounted to 79 and in 2000 to 86. So despite the failure to meet the original indicator, there is a clear upward trend in the absolute number of graduates. The alternative indicator has been reached.

Indicator 5: Eighty per cent of the successful new students at CITT find adequate employment within a year. This project objective indicator is identical with the overall objective indicator of CITT I and has been reached.

To gain a clearer picture of the demand by Salvadorian enterprises for the services of CITT, the following additional project objective indicators were agreed with the executing agency after the final inspection of CITT II:

Additional indicator 1: Capacity utilization at CITT has risen annually by 3% through orders from clients outside the UDB, reaching 30% in 2005. This indicator assumes that capacity utilization at CITT can be divided into student courses and services to third parties. This, distinction, can, however, not be made since students with completely different courses are involved in services to third parties, depending on the individual case. It is not possible to measure this indicator.

Additional indicator 2: As of 2003, the ratio of income earned by CITT to total UDB income increases by 1.5%-2% to at least 20% a year. In 2003, the share of income earned by CITT came to 26.9%, in 2005, to 35.4%. The indicator has been met.

Additional indicator 3: As of 2003, annual income from CITT's external services increases by 2% of total UDB income in 5 years to at least 20%. The share already amounted to 20% in 2003 and last year it came to 29%. The indicator has been met.

Summarizing, most of the project objectives have been achieved to a satisfactory extent (except for the graduation rate).

UDB's operating costs are recovered through income. The UDB surpluses are used solely to finance reinvestments and extension investments by CITT (well over US\$ 1 million since CITT II started operations). The institution is very well maintained and serviced.

The UDB is the leading institution for engineering and technical courses in El Salvador and it is unique. The Ministry of Education and other universities in the country take the UDB and its training philosophy as a benchmark, which indicates the beneficial capacity impacts the project has had on the education sector. The exact influence of UDB graduates on productivity and product quality improvements in Salvadorian enterprises cannot, however, be ascertained because the relevant branches were not specified. Due to the keen demand of industry for graduates from UDB, it is, however, clear that the engineers from UDB play an important and valuable role in national industrial development. Due to the small number of graduates over time, UDB graduates still play a very minor macroeconomic role, however. The services rendered by CITT, in materials testing, metrology and calibration, for example, which are in keen demand and highly valued by El Salvador's industry, have, however, made a contribution to improving product quality. A fundamental connection between the project and the country's improved international competitiveness or improved linkages is not directly attributable for lack of data.

The UDB explicitly targets students from poorer backgrounds. This is remarkable as university education always entails the promotion of elites but in this case the target group is eligible for developmental assistance. Another important current affirmative side-effect of the project is the executing agency's decision to stay in Soyapango, sending an active signal against the increasingly dangerous gang crime and offering teenagers an alternative future.

Women have the same access to universities as men in El Salvador. About 53% of all students in the country are female. Just as in the German Federal Republic, however, the share of women in engineering and technical courses of study is not just much smaller at UDB but also at other universities as well.

The project makes no direct contribution to participation or good governance. Neither the project nor the laboratories it has financed and outfitted has had adverse environmental impacts. Special environmental protection measures did not make up part of the project and were not necessary.

Based on the key criteria, relevance/significance, effectiveness and efficiency, overall project performance is assessed as follows:

The project was relevant; there is still a shortage of engineers (core problem), which poses one of the major constraints on national industrial development. Improving engineer and technician training is essential to eliminate this bottleneck in human resources. The project has made a contribution to this (overall objective achievement to approximate indicator). Furthermore, the target-group alignment of the university counts as a positive feature of developmental significance as does the demand by industry for graduates from the university. The project, however, did too little to exert an active influence on the country's structural deficits (primarily the quality of secondary education as well as the economic situation of the students). Relevance/Significance is judged to be sufficient (Subrating 3).

Except for the unrealistically high target for the rate and number of graduates, the project objectives have been achieved. The students are given a first-class practical training. The contribution made to overall objective achievement has only been very small to date, though. However, thanks to the favourable developments and efforts by the university to raise the number of graduates and capacity utilization, the beneficial effects outweigh these. Effectiveness is sufficient (Subrating 3).

The design of the financed measures was adequate, as were their costs. The now high level of capacity utilization, the satisfactory finances of the university as well as its own additional investments in recent years indicate an efficient use of funds. The high dropout rate (90%), however, is a clear adverse factor that increases the costs per trained engineer very substantially. Altogether, efficiency is therefore accorded the Subrating 4 (slightly insufficient).

In all, the project must still rate as successful. The reasons are first the sustained and professional efforts by the university to make full use of capacity and cover costs, target poor youth, provide excellent practical training and stem student exodus with the means available and second the keen demand by local industry for UDB graduates and CITT services and the steady rise in the number of graduates. The situation has improved significantly since the final inspection of CITT II (2001) thanks to the proactive approach of the executing agency, which has also demonstrated a high degree of professionalism and ownership beyond the project. We gauge the developmental efficacy of the project as sufficient (Rating: 3).

General Conclusions

The low number of graduates is a structural problem in El Salvador affecting all universities. Ideally, flanking measures should have been taken to exert influence on the two factors contributing to the high exodus (poor secondary education and the precarious economic situation of student households) through quality improvement in secondary education in consultation with other donors, increased scholarship programmes, etc. The lessons learnt are therefore: 1. On the one hand, a cooperation project with the university sector (here: especially engineer training) must be aligned more closely with the needs of specific branches (to be able to trace the direct impacts more exactly). 2. In the case of a difficult socio-economic environment as in El Salvador, flanking measures should be carried out to ensure project efficiency.

Assessment criteria

Developmentally successful: Ratings 1 to 3	
Rating 1:	Very high or high degree of developmental efficacy
Rating 2:	Satisfactory developmental efficacy
Rating 3:	Overall sufficient degree of developmental efficacy
Developmental failures: Ratings 4 to 6	
Rating 4:	Overall slightly insufficient degree of developmental efficacy
Rating 5:	Clearly insufficient developmental efficacy
Rating 6:	The project is a total failure.

Performance evaluation criteria

The evaluation of the "developmental effectiveness" of a project and its classification during the ex-post evaluation into one of the various levels of success described in more detail below concentrate on the following fundamental questions:

- Have the **project objectives** been achieved to a sufficient degree (project **effectiveness**)?
- Does the programme generate sufficient significant **developmental effects** (project **relevance** and **significance** measured in terms of the achievement of the overall developmental policy objective defined beforehand and its effects in political, institutional, socio-economic and socio-cultural as well as ecological terms)?
- Are the **funds/expenses that were and are being employed/incurred appropriate** with a view to achieving the objectives and how can the programme's microeconomic and macroeconomic impact be measured (**efficiency** of the programme design)?
- To the extent that undesired (**side**) **effects** occur, can these be tolerated?

We do not treat **sustainability**, a key aspect to consider when a project is evaluated, as a separate evaluation category, but rather as an element common to all four fundamental questions on project success. A programme is sustainable if the programme executing agency and/or the target group are able to continue to use the programme facilities that have been built for a period of time that is, overall, adequate in economic terms, or to carry on with the project activities on their own and generate positive results after the financial, organizational and/or technical support has come to an end.