

トルコ共和国
自動制御技術教育改善計画
技術協力プロジェクト事業完了報告書



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JICA 国際協力機構
自動制御技術教育改善計画 プロジェクトオフィス

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要 約

トルコ職業教育支援のための技術協力プロジェクトは、伸びゆくトルコ産業界が必要としている、質の高い中堅技術者の円滑なる供給を可能とするような職業教育システムの構築支援、を目的とした技術協力である。

近年の進境著しいトルコの産業界にとって、優秀なる中堅技術者の確保は、大変大きな課題であるが、一方、供給側の職業教育システムの現状は、決して産業界が満足するような状態ではない、と思われる。つまり、産業界からの人材需要と実際に教育界から送り出す人材の質との間に、大きなギャップが存在する現実がある。

この点を改善すべく、従来の職業教育機関で送り出す人材よりはるかに質の高い、且つ、あらゆる産業分野で活躍可能な幅広い基礎技術力を身につけた、いわゆるフレキシブルな、中堅技術系の人材を教育する、という目的のために 2001 年 4 月に協力を開始した。

多くの産業界からの人材需要にマッチし、且つ、幅広い技術をまとった教育内容という目的から、電子技術、情報技術、コンピュータによる制御技術、ロボット技術、産業オートメーション技術、という技術カテゴリーのうちごく基本的な部分を、アカデミックな手法ではなく実用的、実務的な見地で履修する、ということ念頭に、従来のトルコにはない、まったく斬新な概念で作成されたカリキュラムによる教育システムである。

このカリキュラムに基づくまったく新しい学科である産業オートメーション技術学科を試行的に設立すべく、イズミールおよびコンヤにおける既設の比較的小規模な 5 年制アナトリア工業高校、2 校にて協力支援を開始した。

カリキュラム、シラバスの設定にあたり、産業界からの要請にマッチした教育システムであることに重きを置きたい、という理由で、カリキュラム/シラバスは地域産業界からの意見、意向を十分斟酌して作成した。このために、イズミールおよびコンヤの産業界とは、相当密度の高い接触を保ちつつ、協力支援にあたったと同時に、産業界からの理解が、以降、大変円滑に得られるようになった、と考える。

2001 年 9 月に最初の学生、イズミール校で 60 名、コンヤ校で 30 名、を迎え、新しい学科の開設に至った。この開講にあたっては、イズミールおよびコンヤの産業界では大変注目する教育システムとして、大きな期待をもって見守られた。そして、2004 年の 6 月から 8 月にかけて、X 年生修了の学生 79 名の学生は、夏季休暇を利用して、教育省で定める 4 週間の企業実習に参加し、地元のイズミール、コンヤの有力企業はもとより、試行的に、イスタンブル、ゲブゼ、アダバザルの日系資本の企業(一部は、トルコ資本の企業)へも、特別に依頼して、企業実習を行った。

この企業実習の結果、ほとんどすべての企業から学生のパフォーマンスに関しては、従来の工業高校の学生には見られない、大変高い評価を得ることが出来た。かいつまんで企業からの評価の一例を示すならば、“4 週間では短すぎる、教えるべきことがたくさんあるのでもっと長期の実習を企画してほしい”、ということや、あるいは、“来年の企業実習では是非とも同じ学生を送り込んでほしい”、という評価を得た企業がかなりあった。

また、一部の企業では、大学生の企業実習と同一のグループに配属となり、開発あるいは設計の部門で、期待よりはるかに高度な内容の実習をさせていただいた。そして、ごく一部の企業ではあるが、非公式に、卒業の暁には学生を採用したい、という企業も現れた。トルコでは、まったく前例のない事態とのことである。

以上のごとく、最初の企業実習は、我々の育てつつある人材を企業サイドから評価していただくはじめての機会であり、十分注意深く、企業実習を設定したのであるが、概略以上のような評価状況であった。このことによって、我々は、初めて、このプロジェクトの妥当性が確認できたと考えた。

この初回の企業実習では、多方面にわたる種類の製造業 26 社に学生を送り込んだのであるが、どの種類の企業からも、学生のパフォーマンスに対して、総じて高い評価をいただいた。この点については、当初我々の考えた重要な目標である、広い分野に適合可能なフレキシブルな人材育成、という観点からも、この支援の妥当性が確認できた、と考えた。

一方、トルコ国民教育省は、これら最初の企業実習の評価、および、従来からの企業からのこのプロジェクトに対する反応に鑑み、産業オートメーション技術学科は、多くの産業界に中堅の人材供給に関して良好なインパクトを与えることが出来ること、および、トルコ職業教育の改革の一環として導入に値する、と考え、この時点で、全国 20 校において、産業オートメーション技術学科を新設すること、および、その為に要する質の高い技術系教官 300 名の育成のための教員養成センターの設置、を正式決定した。つまり、プロジェクト開始以来 4 年目において、はやくも、我々の支援した教育システムの全国普及が正式にトルコ政府によって、方向付けされたことになる。

斯様な、教育システムの全国普及は、当プロジェクトでの“プロジェクト管理表(PDM)”によれば、プロジェクトの上位目標である。プロジェクト目標(このプロジェクトでは、技術移転とその為に教材の開発、と定義されている)が完全に達成されていない時点で、トルコ政府は上位目標の実現にとりかかった、ということは、JICA 支援としては、異例のことではないかと思う。

事実、イズミール校の敷地内に建設中の教員養成センターは、2006 年 4 月には竣工予定であり、また、20 校における産業オートメーション技術学科の新設開講については、そのうち、最初の 10 校は、2005 年 9 月に学生を合計 600 名入学せしめた。残り 10 校についても、引き続き、600 名の学生を入学せしめることによって、2006 年 9 月に開講予定である。

当然ながら、これら拡充 20 校におけるカリキュラム/シラバス、および、教科書は、このプロジェクトで開発したものを使用するという考えを国民教育省は我々に示しており、このことによって、当プロジェクトへの責任の重大さが一層明確になった、と同時に、重くのしかかったことになる。

以上述べたように、このプロジェクトの影響による国民教育省における足並みが、2004 年の企業実習の成功を境に、大変早められたことになった。

斯様な状況下、早いプロジェクト進展について、プロジェクト内での大きな問題は、教科書の開発にあった。つまり、32 科目におよぶ大変高度な専門科目(具体的な科目名は、本文の第 3 章 4 節を参照)をカバーするための教科書は、日本の工業高校からおいでいただいた現職の教官の方々、4 名による開発を JICA としてお願いしてきた。

やや細かい記述になるが、専門家 4 名による教科書開発は、学年進行に合わせて開発を実施する必要から、2001 年から 2002 年にかけて 4 科目、2002 年から 2003 年にかけて 5 科目、2003 年から 2004 年にかけて 4 科目、2004 年から 2005 年にかけて 19 科目、という開発スケジュールである。

以上のスケジュールのうち、最初の 9 科目(2001/2001 年の 4 科目 + 2002/2003 年の 5 科目)は、比較的 low 学年の科目ゆえ、ごく基礎的な内容であること、および、開発すべき科目数も、大体、1 名の専門家が 1 科目を担当する、という負担ゆえ、なんとか開発することができたが、最後の 2 年間に亘る科目は、高学年の科目ゆえ、相当高度な技術を扱う教科書となる。このため、開発に要する時間は、かなり長期間を要することになる。

特に、2004 年/2005 年は、最終学年の科目で、なんと驚くことに、19 科目の多きに渡る教科書を、たった 1 年間で、しかも、わずか 4 名の専門家によって開発する、という殺人的なスケジュール、というより、ほとんど不可能な開発スケジュールであった。これを克服するためには、短期専門家として、多くの工業高校の先生方のご支援をいただいた。

ともかく、これらの教科書開発は、4 名の専門家の方々を中心とした多大なる努力によって、何とか、形になるものを残したのであるが、大変無理なスケジュール下の開発であったゆえ、その出来は、決して望ましい形になっておらず、多くの解決すべき問題点を包含している。多くの開発教科書において、引き続きの大規模な見直し/改訂が不可欠の状態である。特に、これらのカリキュラムおよび教科書は、引き続き 20 校の拡充プロジェクトでも使用する、というトルコ側の考えゆえ、早急の見直し/改訂が必要な状態である。

2006 年 4 月で、このプロジェクトへの協力支援は幕を下ろすが、この教科書開発の点が、最も心残りの事項である。

一応、トルコ側の手によって、根本的な見直し/改訂作業が行えるよう、引き継ぎがなされたのであるが、内容的に相当高度な内容の改訂作業ゆえ、おそらく、トルコ側のみの手による作業では、相当レベルダウンした形での見直し/改訂にならざるを得まい。従来トルコ職業教育にはない高品質な内容での教育を実現するための教科書であったゆえ、トルコの各界から強い支持を得ることが出来たプロジェクトである。しかるに、レベルを低下させた形での見直し/改訂では、この教育レベルの質を下げることを意味し、支援そのものが意味をなさなくなることが懸念される。是非とも、日本側の指導のもとでの、引き続いた見直し/改訂となるよう、切に希望するところである。

このプロジェクトでの支援結果の良好なるサステナビリティ確保の点で、拡充 20 校でも一応の使用に耐え得るような教科書となるまでリファインして後にトルコ側に渡す、このことが、本協力案件の望ましい協力のスコープではないかと愚察する次第である。

最後に、多くの問題を残しつつ終了する、この支援プロジェクトであるが、多くの、且つ大きな誇るべき貢献をトルコ側多方面にあたえたのは事実である。斯様な貢献は、その一因として、日本側からの支援が大変優れていたことを指摘する必要がある。

具体的には、長期あるいは短期の多くの専門家派遣を困難な状況下にもかかわらず、円滑に派遣いただいた多くの工業高校、また、トルコ人教師の研修生としての受け入れを快く引き受けいただいた多くの工業高校および高専、そして、これらの日本側の支援を円滑にゆくようマネージいただいた、

JICA トルコ事務所、JICA 本部、JICA 研修センター、文部科学省、関係する県教育委員会、の各機関における多くの方々、の献身的な協力があつた。これらの協力に対して、深甚の謝意を表する次第である。

また、トルコ側として、国民教育省、計画省、イズミールおよびコンヤのプロジェクトサイト校と関連商工会議所、拡充 20 校および関連商工会議所、実習を引き受けいただいた多くの企業、など大変多くの関係者の強力な支持と理解が、このプロジェクトの効果的、且つ迅速な発展/普及に尽くした功績は計り知れない。同じく、ここに深く感謝の意を伝える次第である。

2006 年 4 月

トルコ・イズミール校のプロジェクトサイトにて
チーフアドバイザー・鈴木靖男

1 プロジェクトの概要

(1) プロジェクト設立の背景

トルコにおける近代産業界からの人材需要に適切に応ずるためには新しい概念に立った中等工業教育が必要であるというトルコ国民教育省及びトルコ産業界からの強い要請に基づき、日本国政府は国際協力機構(JICA)を通じ技術協力スキームによるプロジェクトを設立した。

このプロジェクトは、イズミール及びコンヤにおいて既存の「5年制アナトリア工業高等学校*」にトルコの製造業において最も必要且つ基本的な技術と考えられるコンピュータ制御及び産業ロボット等の技術の習得を中心に据えた「産業オートメーション技術学科」を新設し、これに続き、同学科の生徒に対し関連技術の教育を施すことのできるトルコ人教師(以下、このトルコ人教師を「カウンターパート(CP)」と呼ぶ)の育成を目的としている。

なお、日本政府による協力の大きな特徴としては次のものが挙げられる。

- ア. 日本全国の工業高校から現職の工業高校教諭4名を専門家としてトルコに派遣し、カウンターパート(CP)への技術指導を行う。更に、技術協力活動の総括・指導及び総務全般をそれぞれ担当するチーフアドバイザー及び業務調整員の2名が加わり、総勢6名(今後この6名を「JICA 専門家」と呼ぶ)の人員構成で技術協力活動を展開する。(専門家派遣)
- イ. JICA 専門家が行う産業オートメーション技術の指導及び指導結果のトルコ側への確実な定着を図るため、約3.5億円相当の教育関連資機材をイズミール及びコンヤの両校に供与、設置する。これらの資機材はコンピュータネットワーク技術、コンピュータ制御技術、ロボット、ファクトリーオートメーション技術に関するものである。(機材供与)
- ウ. 6名のJICA 専門家プロジェクトチームは2001年4月より5年にわたってカウンターパート(CP)21名を育成する計画である。カウンターパート(CP)の育成にあたっては彼らを一定期間日本に招聘し、日本の工業高校及び工業高等専門学校等実際の教育現場で日本における教育技術を研修する機会を設定している。(カウンターパートの研修)

これらの中等工業教育を通じて、産業界からの幅広い人材需要に応ずることのできる機動的な人材養成システム、そしてフレキシブル且つ実践的な自動制御技術を有する中堅技術者の産業界への供給システムをトルコに確立しようというねらいがある。

**アナトリア工業高校・5年制工業高校で(15歳～19歳)全国に157校設置されている。1年次(準備学年)は主に外国語を学習し、2年次(9年生)から5年次(12年生)にかけ専門課程を学習するという特徴がある。教育内容及びレベルは日本の工業高校と高専の一部を組み合わせたものと位置づけられる。*

(2) プロジェクトの目的と名称

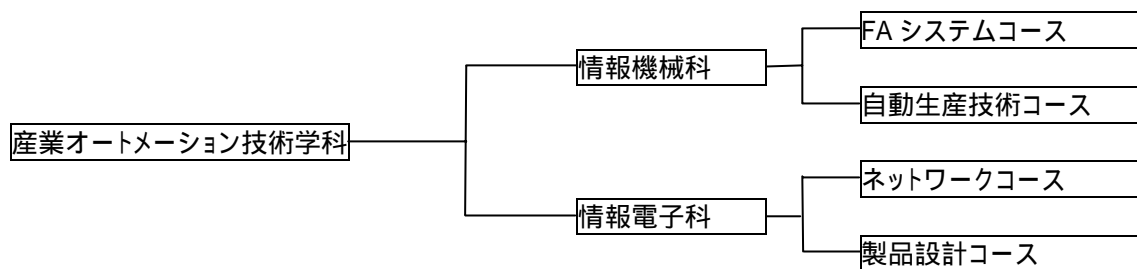
トルコにおいて必要とされている実践的な中堅技術者を効率よく輩出するための中等工業教育システム確立の支援を目的とした日本政府による技術協力プロジェクトで、「産業オートメーション技術学科」を新設する。「自動制御技術教育改善計画」と名づけたプロジェクトである。

(3) プロジェクトの支援期間

日本・トルコ両政府の合意により、日本からの支援期間は2001年4月16日より2006年4月15日までの5年間となっている。

(4) 設立学科の内容

「産業オートメーション技術学科」の下、「情報機械科」及び「情報電子科」(共に30名の生徒数)を設立し、その2科の下にそれぞれ2つの専攻コースを設定する。



「産業オートメーション技術学科」は一口で言うならば、コンピュータによる制御技術及びメカトロニクス/ロボット技術等の基礎を履修する学科で、そのうち、情報機械科はどちらかという工場の生産設備全体を把握するような立場に立った技術を、一方、情報電子科は工業製品の設計に必要な技術をそれぞれ学習するように企画されている。

(5) 技術協力対象校 (プロジェクトサイト)

名称: イズミール・マザール・ゾルル アナトリア工業高校 (技術協力拠点校)

所在地: Kazim Dirik Mahallesi 373/2 No.2/2 Bornova, Izmir, Turkey

連絡先: Tel(90-232)-343-6434/388-3132 Fax(90-232)-388-1800

トルコ西南部の工業都市イズミールにおいて、プラスチック産業を中心に広く活躍中の企業家マザール・ゾルル氏の寄贈によって1998年9月に設立された新しい学校。自動制御学科(2005年廃止予定)、プラスチック技能科(職業訓練学科・3年制教育)およびJICAが支援する産業オートメーション技術学科の3学科を有し、現在の生徒数は520人(2005年9月現在)。6名のJCIA専門家が常駐している。

名称: コンヤ・アディール・カラアチ アナトリア工業高校 (協力・普及校)

所在地: Istanbul Yolu, Yazir Mahallesi, Selcuklu, Konya Turkey

連絡先: Tel(90-332)-216-0158/9 Fax(90-332)-216-0160

トルコ中央部に位置するコンヤ出身の企業家で主にイスタンブールで活躍し、化学薬品、医療品の販売で財を築いたアディール・カラアチ氏の寄贈によって1999年9月に設立された新しい学校。電気学科、電子学科、コンピュータ学科、化学学科およびJICAが支援する産業オートメーション技術学科の5学科(すべてアナトリアタイプ5年制教育)を有し、現在の生徒数は529人(2005年9月現在)。プロジェクトの成果普及モデル校としての位置づけ。JICA専門家が定期的に出張し、技術指導・移転を行っている。

(6) トルコ国民教育省の取り組み

当技術協力プロジェクトの成否は2006年6月に輩出される第1期卒業生の受け入れ先(産業界)からの評価によって決まることは論を待たない。しかし、これまでのところ、当プロジェクトのカリキュラム、教師陣、教育機材等に対しイズミール及びコンヤ両地域における産業界からすでに多大な期待が寄せられていることは事実である。

このような状況に配慮して、今後、トルコ国民教育省はこのプロジェクトの成果をできるだけ早期に全国へ普及展開することを目的とし、トルコ全土の既設工業高校ないしは職業高校の中から20校を選抜し、この20校に「産業オートメーション技術学科」を増設する計画を立案中である。

上述の20校の産業オートメーション技術学科に新たに配置される工業技術系教師は従来どおりの教師ではまったく意味をなさない。むしろ、このプロジェクトで育成しつつある「近代産業界で必要とする技術を十分に教授できる能力」を備えた者でなくてはならず、トルコ国民教育省はこれら教師を早急且つ機動的に育成する必要に迫られている。

そこでトルコ政府は、先ず、2003年度予算でイズミール市に工業技術教育教師の研修のための「In-Service-Training-Centre(ISTC)」を設立することを決定し、予算化させた。

また、将来的に同トレーニングセンターを「Teachers Training Centre(TTC)」に成長発展させることが考えられており、同トレーニングセンターは20校への普及展開計画のみならず、すでにトルコ全土に配置されている工業技術系教師の能力向上および研修のための総合研修施設(日本の「総合教育センター」に相当)として中核的な存在になることが期待されている。

2 プロジェクトの活動要約(目標・成果・活動・運営管理)

両政府間での合意に基づく技術協力プロジェクトを効率よく且つ効果的に実施し、さらに被援助国への貢献を確実なものにするために、"Project Cycle Management"によるプロジェクトの運営管理を JICA として行っている。以下、その主要項目について平易に述べた。

- (1) プロジェクトのスーパーゴール
自動制御技術分野の教育を通じ、産業界から広く必要とされている良質な中堅技術者需要の充足に寄与する。
- (2) プロジェクトの上位目標
産業オートメーション技術学科のトルコ全土への普及・拡充を促進する。
- (3) プロジェクトの活動と目標
アナトリア工業高校 イズミール校・コンヤ校において産業オートメーション技術学科の教育システムを確立し、この分野のトルコ人指導者を育成する。
- (4) 期待されるプロジェクトの活動成果
 - ア. 革新的なカリキュラムを開発する。
 - イ. 新しい学習教材を開発する。
 - ウ. 新しい教育教材を開発する
 - エ. 教師に対する教育技能向上訓練システム(教授法を含む)を確立する。
 - オ. 産業のニーズに即した先端的な教育用資機材を導入する。
 - カ. 上述機材の使用、メンテナンスにかかる技術を指導・移転する。
 - キ. 他校・産業界を含めた一般に対しプロジェクトの活動を成果として公開するため、開発されたカリキュラム、シラバス、教材及びその他全てのノウハウをデジタル化し、通信ネット上にのせる。なお、教材については学校関係者にのみ公開する予定。
 - ク. 産業界のニーズを把握するためのシステムを構築し、これに基づく新しい教育システムが普及する。
- (5) プロジェクトの活動の具体例
 - ア.-1 カリキュラムの策定
 - ア.-2 カリキュラムに基づいたシラバスの作成
 - ア.-3 産業界のカリキュラムに対する満足度調査
 - イ.-1 教科書の執筆(暫定版)
 - イ.-2 教科書の執筆(初版)
 - イ.-3 実習書の執筆
 - イ.-4 実験・実習装置の製作
 - ウ. 教師用指導書の作成
 - エ. 関連教科の技術移転と教授法の指導
 - オ.-1 実習機材リストの作成
 - オ.-2 上述機材の調達
 - オ.-3 供与された訓練資機材等に対する産業界の満足度調査の実施
 - カ. 上述機材の適正使用とメンテナンスに関する技術移転
 - キ.-1 上記ア.-1～カで作成した情報のデジタル化
 - キ.-2 デジタル化した情報のインターネットによる公開
 - ク.-1 良質な中堅技術者の需要に対する産業界のニーズ把握
 - ク.-2 新規教育システム紹介のための企業向けセミナーの実施
 - ク.-3 他校教員向けの産業オートメーション技術及びその教授法に関するセミナーの実施
- (6) プロジェクトの運営
 - ア. プロジェクトの日常運営
 - 6名の JICA 専門家によるイズミール校及びコンヤ校カウンターパート(CP)への技術移転については、2週に一度の割合で技術移転の進捗状況確認とその問題を正確に把握する機会を設けている(隔週開催の「専門家連絡会」)。

これらの進捗確認と問題点の把握について、おおむね 2 から 3 ヶ月毎に一度、国民教育省責任者、両校のプロジェクト管理責任者(校長)、カウンターパート(CP)及び JICA 専門家等の関係者が一同に会し、プロジェクト進捗の全体的なレビュー/評価を実施する(プロジェクト進捗会議“Project Progress Meeting(PPM)”)を開催している。

このことによって、プロジェクトの進捗のみならず、トルコ国民教育省、学校教育現場、プロジェクトを実際に支援する JICA 専門家の各者間で活動成果/評価に対する考え方のギャップを解消することに大きく寄与している。

更に、このプロジェクト進捗会議での協議結果は概ね毎年実施される日本・トルコ合同調整会議(プロジェクトの最高意思決定機関“Joint Coordination Committee(JCC)”)の場に提出され、プロジェクトレビューと今後の計画変更/修正に反映されることになっている。これら「専門家連絡会」、「Project Progress Meeting(PPM)」、「Joint Coordination Committee(JCC)」等一連のハイアラキーが本プロジェクトの重要な運営管理を形成している。

イ. 教科書開発

産業オートメーション技術学科は、比較的先端的且つ高度な技術の履修を目的とする教育システムである。しかし、確立しようとしている教育システムは中等教育のカテゴリーに属する学科であるため、教育内容はアカデミックな手法よりむしろ実践的な技術の習得に重きを置いた手法によって教科書を開発するという考え方に立っている。なお、5 年間の協力期間において産業オートメーション技術に関する基礎及び応用技術の約 30 科目について教科書を開発し、トルコ側へ引き渡す計画である。

ウ. 技術進捗への対処

産業オートメーション技術は、産業界からのニーズが高い共通的な技術といえる半面、進捗が激しく履修した技術が陳腐化しやすい。従って、この分野で活躍する若き人材は常に自分自身をブラッシュアップし、技術の流れ/進歩をフォローする能力を習得することが必要である。このことは、本学科で学ぶ生徒のみならず、教える側の教師(カウンターパート(CP))にとっても重要である。このような技術進歩をフォローし、よければ、新たな技術の流れを創出するような立場に立てよう、基礎科目にも十分配慮した内容とする教科書開発を行う。具体的には、「工業数学」、「情報技術基礎」、「電子工学」等の基礎技術分野も許す範囲内で多く取り入れたカリキュラム/教材を提供し、将来の技術進捗にも十分適応できるフレキシブルな人材育成を実践できるよう配慮する。

3 産業オートメーション技術学科

(1) 産業オートメーション技術学科の特徴

産業オートメーション技術学科は、最新のオートメーション技術、特にコンピュータネットワーク技術とコンピュータ制御技術及びマイクロコンピュータを用いたシステム技術に対応できる中堅技術者の育成を目的としている。生徒達は、「電気・電子技術」、「機械技術」、「コンピュータ」、「ネットワーク」の基礎を共通に学び、さらにそれぞれ分野において専門的な学習を行う。問題解決能力を有する実践的な技術者となるために、生徒達は基礎的な学習の段階から、自ら考え自ら創造する学習態度が求められ、数学を用いた工業事象の解析や品質管理などの工場管理技術も学習する。

(2) 情報機械科

FA(ファクトリオートメーション)に関わる次の技術を共通に学ぶ。

- ・ シーケンスコントロール技術
- ・ 産業用ロボット
- ・ FA セル(コントローラ、ロボットなどで構成されるシステムユニット)
- ・ CNC 加工(コンピュータ制御による加工技術)

より専門性を深めるため、コース別に次の技術をさらに学習する。

ア. FA システムコース

- ・ ネットワークを用いた遠隔操作システムなど FA 全体のコントロール技術

イ. 自動生産技術コース

- ・ 加工の自動化技術

(3) 情報電子科

「メカトロニクス」技術についてさらに深く学ぶ。その後、最終学年の12年生で次の2つのコースに分かれて学習する

ア. 製品設計コース

マイクロコンピュータを用いた製品の開発(エンベデッドシステムの設計)ができる技術者の育成を主眼におき、次の技術を学ぶ。

- ・ リアルタイム OS を用いたシステム設計
- ・ アナログ信号を高速にデジタル信号に変換し、デジタルで信号処理を行う「DSP」
- ・ デジタル回路をハードウェア記述言語により作成する「PLD」

イ. ネットワークコース

現在の高度情報化社会の中で、企業内のネットワーク管理やシステム構築ができる技術者、さらにはプロバイダなどで活躍できる技術者の育成を主眼におき、次の技術を学ぶ。

- ・ ネットワークシステムの設計
- ・ サーバー構築とセキュリティ技術
- ・ Web システムの製作と運営

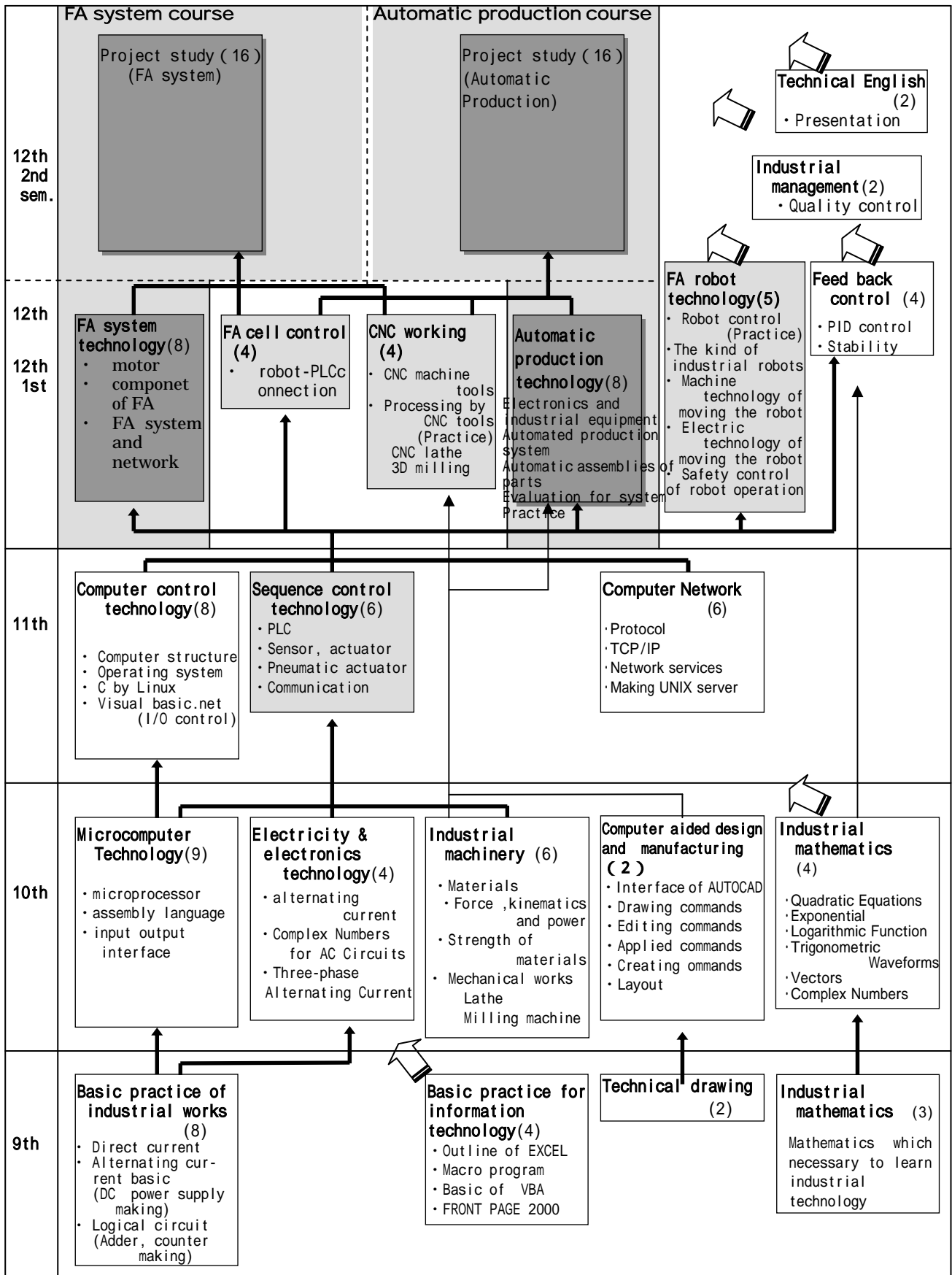
(4) カリキュラム (情報電子科)

	科目		選択	予備学年	9年生	10年生	11年生	12年生	
								前期	後期
共通一般科目	Turkish	トルコ語		4					
	Turkish Language and Literature	トルコ語、文学			4	2	2		
	Religious Culture and Ethics	宗教、道徳			1	1	1		
	History	歴史			3				
	Geography	地理			2				
	Mathematics	数学		4	4				
	Biology and Hygiene	生物と衛生			2				
	Physics	物理			2				
	Chemistry	化学			2				
	Foreign language	外国語		24	6	4	4	4	
	History of Revolution and Ataturk'S principle	改革の歴史とアタチュルクの方針						2	
	Natinal Security knowledge	国家保安				1			
	Philosophy	哲学					2		
	Gymnastics	体育		2					
合計			34	26	8	11	4		
一般科目	Biology	生物				2	3		
	Physics	物理				3	3	2	
	Chemistry	化学				2	3	2	
	Mathematics	数学				3	3	3	
	Geometry	幾何						3	
	合計			0	0	10	12	10	
専門科目	Computer	コンピューター一般		2					
	Basic practice of Industrial works	工業基礎			8				
	Basic practice of Information technology	情報基礎			4				
	Industrial mathematics	工業数理			3				
	Technical drawing	工業製図			2				
	Micro computer technology	マイクロコンピュータ				9			
	Electricity and Electronics	電気電子				4			
	Industrial mathematics II	工業数理 II				4			
	Industrial machinery	工業機械				6			
	CAD/CAM	CAD/CAM				2			
	Computer control technology	コンピュータ制御技術						8	
	Computer network	ネットワーク基礎						6	
	Mechatronics	メカトロニクス						6	
	Industrial management	工業経営管理							2
	Technical English	工業英語							2
	Feed back control	フィードバック制御							4
	Sequence control technology	シーケンス制御							5
	Industrial products design	製品設計	製設						8
	Programming logic device	プログラムロジックデバイス	製設						4
	Digital signal processing	デジタルシグナルプロセッサ	製設						4
	Network server and security	ネットワークサーバー、セキュリティ	ネット						6
	Network system	ネットワークシステム	ネット						4
	Web system technology	ウェブシステムテクノロジー	ネット						6
Project study	課題研究							16	
合計			2	17	25	20	29	29	
総合計			36	43	43	43	43	43	
Guidance	ガイダンス		1	1	1	1	1	1	

他に、選択授業があり年間授業は、10年生以降ほぼ45時間/週となる。

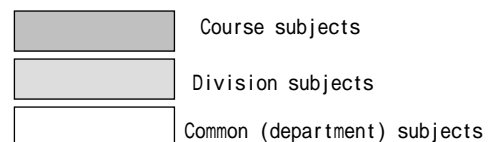
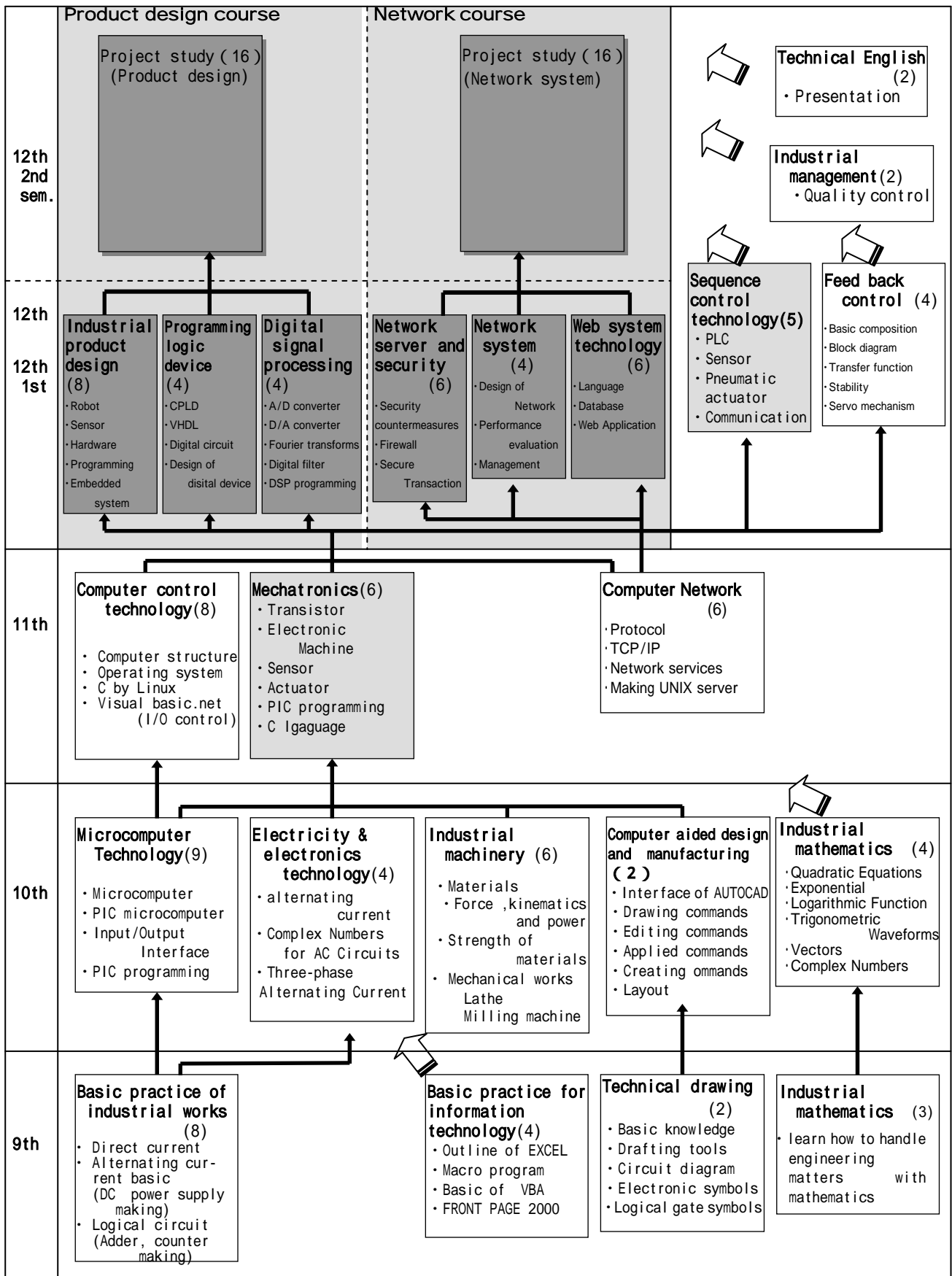
(5)科目系統圖 (情報機械) Related diagram of Information Machinery 's subjects (Plan)

2005/7/22



- Course subjects
- Division subjects
- Common (department) subjects

(5) 科目系統圖 (情報電子) Related diagram of Information Electronics' subjects (Plan)



Subject	2001/2002			2002/2003			2003/2004			2005/2006		
	I.M.(IZM)	I.E.(IZM)	I.E.(KON)	I.M.(IZM)	I.E.(IZM)	I.E.(KON)	I.M.(IZM)	I.E.(IZM)	I.E.(KON)	I.M.(IZM)	I.E.(IZM)	I.E.(KON)
9th												
Basic practice of industrial works (8)	Hasan	Selim	Osman	Hasan	Selim	Osman	Mehmet	Sedat	Ibrahim	Hasan	Sedat	Ibrahim
Basic practice for information technology (4)	Egemen	Egemen	Yuksel	Guliz	Sedat	Yuksel	Guliz	Sedat	Osman	Murat	Sedat	Osman
Technical drawing (2)	Egemen	Egemen	Yuksel	Mustafa.G	Turgay	Murat	Mustafa.G	Turgay	Osman	Hasan	Mustafa G	Abdurrahman
Industrial mathematics I (3)	Hasan	Selim	Yuksel	Hasan	Selim	Yuksel	Mehmet	Guliz	Melek	Mehmet	Telat	Melek
Industrial machinery (2)	Hasan	Selim	Osman	/	/	/	/	/	/	/	/	/
10th												
Microcomputer Technology (9)				Egemen	Turgay	Melek	Mustafa.G	Selim	Melek	Unal	Selim	Yuksel
Electricity & electronics (4)				Egemen	Sedat	Osman	Hasan	Selim	Osman	Hasan	Selim	Melek
Industrial machinery (6)				Mustafa.G	Turgay	Murat	Mustafa.G	Turgay	Yuksel	Mehmet	Mustafa G	Murat
CAD/CAM (2)				Guliz	Mustafa.G	Melek	Guliz	Mustafa.G	Melek	Mustafa G	Mustafa G	Murat
Industrial mathematics II (4)				Guliz	Hasan	Yuksel	Guliz	Hasan	Yuksel	Guliz	Gurcan B.	Melek
11th												
Computer control technology (8)							Gurcan.C	Gurcan B	Yuksel	Gurcan Ç.	Gurcan B.	Yuksel
Computer Network (6)							Kahraman	Gurcan Ç.	Ibrahim	Gurcan Ç.	Mustafa N.	Ibrahim
Sequence control technology (6)							Kahraman	/	/	Kahraman	/	/
Mechatronics (6)							/	Gurcan.B	Osman	/	Gurcan B.	Osman
12th												
Technical English (2)										Mustafa G	Turgay	Murat
Industrial Management (2)										Guliz	Guliz	Melek
Feed Back Control (4)										Ünal/Murat	Ünal/Murat	Israfil
FA robot technology (5)										Murat	/	/
Sequence control technology (5)										/	Kahraman	Osman
FA system technology (8)										Telat	/	/
Automatic production technology (8)										Mustafa G	/	/
FA cell control (4)										Telat	/	/
CNC working (4)										Hasan	/	/
Industrial product design (8: 1st semester only)										/	Mustafa N	Murat
Programming logic device (4: 1st semester only)										/	Selim	Osman
Digital signal processing (4: 1st semester only)										/	Mustafa N	Melek
Network server and security (8: 1st semester only)										/	Bülent	Yavuz
Network system (4: 1st semester only)										/	Ünal	Yuksel
Web system technology (4: 1st semester only)										/	Bülent	Yavuz
Project Study (16: 2nd semester only)										Kahraman/ Telat/ Hasan/ Mustafa G	Mustafa N/ Selim/ Bülent/ Ünal	Murat/ Osman/ Yavuz/ Yuksel

プロジェクト組織図

トルコ側

日本側

国民教育省

技術職業教育局総局長
副局長
部長

国際協力課長

カリキュラム開発課長

プロジェクト対象校

開発した教材、成果を順次
移転

拠点校 (Izmir)
プロジェクトの拠点
CPへの技術移転

普及校
(Konya)

校長

校長

教諭

教諭

教諭

研修は拠点校で実施

合同調整委員会
(JCC)
印はメンバー

日本大使館
(JCC オブザーバー)

JICA トルコ事務所

専門家チーム

チーフアドバイザー

業務調整員

専門家

国家開発計画
委員会代表

*自動制御科の設置
*カリキュラムの普及

産業界のニーズ

地域の関連
産業界の代表

卒業生の就職

産業界のニーズ

他のアナトリア
工業高校

成果の
普及

**TEACHERS and OTHER PERSONNEL OF
MAZHAR ZORLU ANATOLIAN TECHNICAL HIGH SCHOOL**

MANAGEMENT					
1	Sarı ÇALIŞKAN		School Director		
2	Şerafettin BAYRAM		Main Deputy Director		
3	Yıldıray SOLTEKİN		Deputy Director		
4	Turgay İŞBİLEN		Deputy Director		
5	Ramazan KURT		Deputy Director		
6	Hüseyin KIZMAZ		Deputy Director		
COMMON SUBJECT TEACHERS			TECHNICAL SUBJECT TEACHERS		
	Name	Branch		Name	Branch
7	Sevim GÜLEÇ	Turkish	25	Mustafa YILMAZ	Plastics Dept. Chief / Machine Art
8	Hasan SİLAY	Turkish	26	Kadir DEVREN	Plastics Dept. / Smoothing
9	Şerife MUŞTU	History	27	Mustafa PARMAKSIZ	Plastics Dept. / Smoothing
10	Sevcan TOPUZ	Mathematics	28	Nedim SÖZER	Plastics Dept. / Molding
11	Fatma DAĞDELEN	Mathematics	29	Enver KAYA	Plastics Dept. / Molding
12	İsmail KAYMA	Mathematics	30	Tekin BALKIZ	Plastics Dept. / Molding
13	Sevgi ARIK	Guidance	31	Mehmet KAVAKLI	Plastics Dept. / Molding
14	Servet DEMİRCİ	Guidance	32	E. Sabri SÖNMEZ	Plastics Dept. / Molding
15	Fatma GEZER	Philosophy	33	Özay OKUR	Plastics Dept. / Machine Art
16	Şenay GÜNEŞ GÜNDEM	Physics	34	Şenay ÖZÇAM	Electronics
17	Ekberk ÖZTÜRK	Physics	35	Murat ÖZDEVECİ	Ind. Auto. Dept. Chief / Machinery
18	Saadet AKDENİZ	Chemistry	36	Mustafa GÜNEŞ	Ind. Auto. Dept. / Machinery
19	Aylin ÇETİNKAYA	Biology	37	Selim GÜLÇEN	Ind. Auto. Dept. / Electricity
20	Fidan ÖZDEMİR	Biology	38	Kahraman ÖNEY	Ind. Auto. Dept. / Electricity
21	İclal KÜÇÜKER	Geography	39	Gürcan BILDIR	Ind. Auto. Dept. / Electricity
22	Ö. Senem KEŞKEK	English	40	Sedat ELBİR	Ind. Auto. Dept. / Electricity
23	Yelda ATEŞ	English	41	Hasan YILDIZ	Ind. Auto. Dept. / Machinery
24	Ali İSTANBULLUOĞLU	Gym	42	Telat GÜLER	Ind. Auto. Dept. / Electronics
			43	O. Egemen DÖĞER	Ind. Auto. Dept. / Computer
			44	Ünal SEVİM	Ind. Auto. Dept. / Computer
			45	Mustafa NAZMAN	Ind. Auto. Dept. / Computer
			46	Bülent VARDAL	Ind. Auto. Dept. / Computer
			47	Gürcan ÇAYIR	Ind. Auto. Dept. / Computer
			48	Güliz GÜLSEVİN	Ind. Auto. Dept. / Machinery
			49	Mehmet ARIKAN	Ind. Auto. Dept. / Machinery
			50	İsmail AKTAŞ	Ind. Auto. Dept. / Electronics
			51	Ahmet ÖZKAN	Ind. Auto. Dept. / Electronics
OTHER STAFF					
52	Vahdettin KURT		Technician		
53	Yeşim KAVCI		Officer		
54	Hüseyin GÖKÇEOĞLU		Worker		
55	Şaban KESKİN		Driver		

(8) 両校の職員 (コンヤ校)

**TEACHERS AND OTHER PERSONNEL OF
ADİL KARAAĞAÇ ANATOLIAN TECHNICAL HIGH SCHOOL**

No	Name	Branch
Management		
1	Muzaffer APAN	Director
2	Alaaddin DEMİRKAYA	Deputy Director
3	Hergüner VERİNÇ	Deputy Director
General Culture Subjects		
4	Murat DEMİR	English
5	Ali BACAĞ	English
6	Sıddıka AKINCI	English
7	Mehmet KARABULUT	English
8	Şerife YILDIZ	English
9	Reyhan KAFALI	English
10	Aynel ÖZOL	English
11	Muhlis TURİNAY	English
12	Mehmet SAĞDIÇ	History
13	Sami GÜVENÇ	History
14	Mustafa KARABİLGİN	Chemistry
15	Muammer GÖKMEN	Chemistry
16	Ahmet ŞİMŞEK	Chemistry
17	Osman DAŞBADEM	Religious Culture
18	Bahattin ERTUĞRUL	Turkish and Literature
19	Hasan Hüseyin ESER	Turkish and Literature
20	Ramazan HANEDAR	Mathematics
21	Metin ÖZEL	Mathematics
22	Yaşar Gökhan GÜLVEREN	Mathematics
23	Mevlüt KALAK	Geography
24	Mustafa YAMAN	Biology
25	Nuran BAKAR	Biology
26	Habib KAPLAN	Physics
27	Mahmut TAMTÜRK	Physics
28	Hasan BAKAR	Gym
Technical Subjects		
29	Osman KÖSE	Ind. Auto. Dept. /Electricity
30	Yüksel ÇINAR	Ind. Auto. Dept. / Electricity
31	Melek TOTAN	Ind. Auto. Dept. / Electronics
32	Murat AKDOĞAN	Ind. Auto. Dept. / Machinery
33	İbrahim APA	Ind. Auto. Dept. / Computer
34	Yavuz BUYRUKBİLEN	Ind. Auto. Dept. / Electronics
35	İsrafil BAYRAM	Ind. Auto. Dept. /Computer
36	Ali HATİPOĞLU	Electricity
37	Abdurrahman KAPLAN	Electricity
38	Abdurrahman KAVUN	Electronics
39	Enver YORULMAZ	Electricity
40	Semih AKALIN	Electricity
41	Ramazan DEMİRKAN	Electronics
42	Reha GÖNÜLLÜ	Computer
Other Staff		
43	Osman KARA	Officer
44	Kemal ANAÇ	Care Taker

MAZHAR ZORLU ANATOLIAN TECHNICAL HIGH SCHOOL
STUDENT NUMBERS
(As of 2005 – 2006 academical year)

Grades	Departments		Boys	Girls	Total	
New 9th Grades	Industrial Automation	Electronics	29	1	30	
		Machinery	32	0	32	
	TOTAL		61	1	62	
9th Grades	Plastics Processing	A	28	0	28	
		B	27	0	27	
		C	26	1	27	
		D	8	0	8	
	Industrial Automation	Electronics	24	0	24	
		Machinery	21	0	21	
	TOTAL		134	1	135	
10th Grades	Plastics Processing	A	28	3	31	
		B	24	0	24	
		C	27	0	27	
	Industrial Automation	Electronics	29	0	29	
		Machinery	25	1	26	
	TOTAL		133	4	137	
11th Grade	Plastics Processing	A	30	1	31	
		B	30	0	30	
		C	0	0	0	
		Waiting Students	23	2	25	
	Industrial Automation	Electronics	27	0	27	
		Machinery	18	2	20	
		Waiting Students	9	1	10	
	TOTAL		137	6	143	
12th Grade	Industrial Automation	Electronics	Production Design Sub-Group	9	2	11
			Network Sub-Group	11	0	11
	Machinery	Automatic Production Sub-Group	9	1	10	
		FA Systems Sub-Group	11	0	11	
	TOTAL		40	3	43	
	GENERAL TOTAL		505	15	<u>520</u>	
Total of Plastics Process Department			258			
Total of Industrial Automation Technologies Department			262			
GENERAL TOTAL			<u>520</u>			

ADIL KARAAGAC ANATOLIAN TECHNICAL HIGH SCHOOL
STUDENT NUMBERS
 (As of 2005 – 2006 academical year)

Grades	Department		Boys	Girls	Total
New System 9th Grades	Electricity		24	0	24
	Electronics		0	0	0
	Computer		14	10	24
	Chemistry		9	15	24
	Industrial Automation (electronics)		28	2	30
	Industrial Automation (machinery)		30	0	30
	TOTAL		105	27	132
9th Grades	Electricity		32	0	32
	Electronics		29	0	29
	Computer		21	9	30
	Chemistry		12	18	30
	Industrial Automation (electronics)		29	1	30
	Industrial Automation (machinery)		0	0	0
	TOTAL		123	28	151
10th Grades	Electricity		19	0	19
	Electronics		20	1	21
	Computer		15	5	20
	Chemistry		10	9	19
	Industrial Automation (electronics)		23	4	27
	Industrial Automation (machinery)		0	0	0
	TOTAL		87	19	106
11th Grades	Electricity		18	0	18
	Electronics		23	0	23
	Computer		15	11	26
	Chemistry		4	10	14
	Industrial Automation (electronics)		30	0	30
	Industrial Automation (machinery)		0	0	0
	TOTAL		90	21	111
12th Grade	Industrial Automation (electronics)	Product Design Sub-Group	16	0	16
		Network Sub-Group	13	0	13
	Industrial Automation (machinery)		0	0	0
	TOTAL		29	0	29
	GENERAL TOTAL		434	95	<u>529</u>
Total of Electricity Department			93		
Total of Electronics Department			73		
Total of Computer Department			100		
Total of Chemistry Department			87		
Total of Industrial Automation Technologies Department			176		
GENERAL TOTAL			<u>529</u>		

4 プロジェクト実施運営上の課題

日本の職業教育支援という面からこのプロジェクトを振り返ると、従来の途上国支援にはなかった幾多の画期的な点があった。これらについて、以下に言及する。

(1) なぜ「産業オートメーション技術」なのか

トルコの職業教育を振り返ってみると、かなりの絞った形の技術を教育する、という立場が強かったようである。しかし、近年の産業界の激変によって、特に中堅の技術者需要に、職業教育界サイドからの人材供給が円滑にフォローし切れていないのではないかと考えた。そこで、支援のターゲットとしては、できる限り多くの産業界からの技術系中堅の人材需要をカバーする、ということを基本にして、産業界共通の技術、という観点から、コンピュータ制御に関する技術、ロボット/ファクトリーオートメーションの技術、に接続される技術を教える、という基本目的に到達した次第である。したがって、従来のトルコの職業教育にはない、かなり、幅の広い技術を学習するカリキュラムになった。このことによって、従来にはないかなり広範囲な分野に亘って、産業界に人材を送り込む、という方向付けを行った。

(2) その教育のレベルについて

同じくトルコ産業界からの要請として、現在の職業教育レベルと産業界からの人材需要レベルとは、開きがありすぎる、という指摘があった。人材を送り出す側の体制が産業界からの需要に、いつの間にか、追いついていないという状況になってしまったことが大きな問題、と捉えた。そこで、これを解決するために、思い切って教育レベルを高めたカリキュラムの設定とした。つまり、相当高度な技術を中等職業教育機関で教える、ということである。このために、使用する教科書開発の点で大きな苦労が伴った。高い技術をやさしく教える、というこの難題に挑戦した形の教科書開発となったのであるが、率直に申して、この点で、現在の教科書は道半ば、という状態である。トルコ側が果たして、この高いレベルを堅持したまま、教科書開発の継続を実行してくれるか、大変気がかりな点ではある。

(3) 産業界への広報活動について

斯様にかなり意欲的なカリキュラムを有する学科になったと自負するのであるが、問題は、これを如何に産業界へ広報するか、という点で困難に直面した。もちろん、卒業生を送り込んでその評価を待てばよいのであるが、もっと早い時期に、何とか産業界からの評価をいただきたいと考え、いくつかの広報活動を企画し実施した。

その 1

カリキュラム構成としては、専門課程の最初の2年間は技術基礎の学習がメインであり、最後の2年間は高度な応用技術の学習、となっている。そこで、2002年9月から始まるIX年生の開講直前に、イズミールおよびコンヤの産業界の方々へ、基礎技術として、この学科では、このよ

うな技術を学習しますよ、という学習シラバスの説明/解説をおこなった。そして、産業界学習シラバスに関するコメント/意見を聴取した。このことは、予想に反して、大変な好評を産業界から得た。同じく、2004年9月から開講するXI年生において、その開講直前に、産業界の代表の方々へ、カリキュラム後半の学習科目のシラバスについて、説明/解説をおこなった。これらのごことによって、具体的に当学科は何を教育するのか説明した。これらの機会を通じて、産業から具体的な学習事項のコメントを頂き、直ちにシラバスへ反映したことは言うまでもない。この学科のシラバスを見た企業は、大変な驚きをもって我々に接し始めた。なぜならば、各企業の弁では、斯様な学科こそが、今まで産業界で欲していた教育であること、何ゆえ、教育省は、今まで、日本が言われるまで、斯様な点に気がつかなかったのか、という点を力説されていた点は、印象的であった。

その 2

トルコ国民教育省職業教育総局の規則に従うと、我々の支援するアナトリア工業高校の場合、X年生およびXI年生が終了した時点で、おのおの160時間の企業実習を企画し、学生をして参加せしめる、ということである。これは、当学科を産業界へ広報する絶好の機会と考え、2004年7月から8月にかけて、イズミールおよびコンヤの学生(X年生修了の)69名を、イズミール、コンヤ、イスタンブル、ゲブゼ、アダバザル、のトルコを代表する企業に、工場実習生として、4週間送りだした。事前に、学生を送り込みたいと考える全工場を訪問し、如何に我々の学生が優れているか、という、世間で言うPR活動を行い、ともかく、工場実習を受け入れていただき、我々の育てた学生を見てほしい、という申し入れをし、あわせて、受け入れ後の評価をいただくようお願いした。企業実習の結果は、ほとんどすべての企業からは、大変な高い評価が得られた。レベルはやや、落ちるものの、ほぼ大学の工学部と同等な技術範囲をカバーする知識を身につけつつある学生ゆえ、多くの企業は、驚嘆の叫びすら上げていたようだ。一部の企業で、大学生とまったく同じグループに配置され、高度な開発部門での仕事を体験させた例もあった。また、やはり、多くの企業では、優秀な学生ゆえ、たった4週間では短すぎる、もっと長い期間の実習を設定するよう、要望があった。

以上の2点に亘る産業界との接触、つまり、シラバスの説明と企業実習への学生の送り込み、この2点の評価を経て、初めて、このプロジェクトのトルコへの有用性を確信できるに至った。

(4) 教科書の開発について

斯様に産業界から大変に高い評価と大きな期待とをもって迎えられつつあるこの学科であるが、その理由は、大変質の高い工業教育レベルと幅の広い工業技術の付与、というある意味では相矛盾することを、同時にほぼ満足するようなカリキュラムである、と考える。斯様な職業教育は、従来のトルコには経験のしたことの無い、まったく新しい取り組みである。大学卒の人材をとりざるを得ない、と考えていた企業の方々にとって、まさに大変な朗報であったわけである。トルコでは、大学卒は、大変数が少なく、日本のように、大卒の人材需要が大変容易にある、という状況にはまったく無い。ところで、斯様な高い教育レベルを保つキーポイントのひとつが、良質な教科書を開発すること、と我々

は考えた。つまり、高い技術をやさしく教える、ということの基本にした教科書開発である。この点で、このプロジェクトは、大いに、艱難辛苦したわけである。なぜならば、これら教科書の開発要員は、長期専門家で来られた4名の日本の工業高校からの現職の教官の方々である。

これらの4名の先生方によって、

2001年4月から2002年8月までの間に、4科目の専門科目の教科書開発をする、

2002年9月から2003年8月までの間に、5科目の専門科目の教科書開発をする、

2003年9月から2004年8月までの間に、4科目の専門科目の教科書開発をする、

2004年9月から2005年8月までの間に、19科目の専門科目の教科書開発をする、

という、以上は大まかな教科書開発日程であるが、斯様な開発スケジュールであった。カリキュラムをみていただくとよく理解できると思われるが、最初の年は、まだ初級科目であったため、何とか開発出来たが、3年目から急激に扱うが技術が高度になり、期日内での開発に困難をきたすようになってきた。特に、2004年9月から2005年8月までの間に、19科目の専門科目の教科書開発をする、というスケジュールにいたっては、魔法でも使わない限りまったく不可能と考えられる。斯様な膨大な科目をたった4名の長期専門家の方々で開発することはまったく不可能であったゆえ、かなりの人数の短期専門家の助けによって、教科書の執筆は何とか仕上げたのであるが、その出来は、既述のごとく、今後の一層の見直し/改訂を要する状況である。事実、後半の教科書開発は大変未熟な完成度であり、今後継続的に、早急に見直しと改訂を実施しないと、教科書として用を成さなくなる懸念が多である。この点については、以降の見直しと改訂については、トルコ側に引き継いだ。教科書開発すら満足でない状況であるゆえ、その結果のトルコ側への技術移転にいたっては、大変不十分な状態である。斯様な状況下のトルコ側による引き続きの教科書の見直しと改訂作業は、教育レベルの質を落とした形の教科書改訂になるのでは、という懸念が大いに心配される。当然、開発教科書の内容にもよるが、この程度の職業教育の場合、専門家に課すことが出来る教科書開発負担は、年間1名の長期専門家につき1科目、が限度である、ということである。斯様な教訓が得られたことは、このプロジェクトの大きな成果である。この限度を超える開発負担は、どこかに無理がでる結果になることを、今後、他の機会にも十分配慮すべきである。

(5) 機材の導入について

約3億5千万円の機材を導入したことになる。電子部品、電子測定器類、コンピュータ等情報機器類、ロボット/制御関連等の機材、ファクトリーオートメーションの機材、等が主要機材である。これらの機材は、幸い、2003年6月でほとんどが設置を終了した。この点が、技術移転、技術指導の上で大変効果的であった。斯様に、プロジェクト開始から2年を終了した時点で、あるいは3年目にかかった時点で、主要機材はすべて設置し終わったのであるが、この点は、効果的な技術指導を実施するうえで大変有効であった。このためには、実は、機材の準備作業は、プロジェクトが開始される約1年以前から、日本の文部科学省、工業高校のご協力を得て、進められてきた。斯様な、表に見えざる支援が、このプロジェクトの場合あったことは、大変な幸運であったと思う。関係のご支援いただいた多くの方々に深謝する次第である。

(6) 2000年10月のRD締結に至るまでの問題

実は、この産業オートメーション技術学科設立支援のプロジェクトは、表記 RD 締結までに、実に 5 回の調査団を送っている。初回の調査団は 1999 年 2 月であった。それから、1 年 8 ヶ月後に RD 締結に至ったのであるが、この間 5 回の調査は、異例であったろう。当初、トルコ側からの要請だけでは、一体何を支援したらよいのか、まったく見当もつかない状態であった。大変多くの討論をトルコ側各界と重ね、トルコ側の状況/背景を把握し、かつ日本側も納得する支援の形に持ってゆくのに、大変多くの討論を要した。このことが、今日のプロジェクトの成功につながったことは、論を待たないと確信する。先にも触れたように、主要供与機材の仕様がほぼ決定したのは、プロジェクトの開始前であったが、つまり、プロジェクト開始と同時に、直ちに機材の発注が出来たのであるが、斯様な点も含めて、プロジェクト開始以前の調査の段階で、トルコ側とのコミュニケーションが存分に果たせたことは、技術協力の円滑且つ効率化の点で、おおいに貢献があったと考える。プロジェクト開始以降は、まったく迷うことなく、目的に向かって進むことが出来た。この点を強調しておきたい。

5 今後への橋渡し

5 年間に亘って実施されたこのプロジェクトは、全体的な進行状況から見ると、「道半ば」という状態かと思う。JICAとして、2006年4月でこのプロジェクトへの支援を終了するに当たって、引き続き(トルコ側によって)継続し、発展されるべき事項を以下に記す。以下の4項は、いずれも、この支援プロジェクトの成果/結果として生じてきたものであり、JICAとして何らかの引き続きの支援を継続することをトルコ政府としては強く希望してきたところである。しかし、その要請にもかかわらず諸般の事情でJICAとしては、本件にかかわる支援を2006年4月で完全に打ち切ることを決定しているため、本プロジェクトで掲げた最終目標に向けて、今後の橋渡しの意味合いで以下に整理した。

(1) 教科書の改訂について

既に第4章で説明したように、専門科目前32科目をカバーする教科書は、今後、引き続いて20校拡充計画での新設学科で使用される。開発のために時間的な制約から、様々な点において依然未熟な点が多々あり、これらの点について、引き続き、一層の見直し/改訂が必要である。トルコ側の積極的な取り組みが期待される。もっとも、5年間という歳月で、4名の長期専門家によって32科目をカバーする専門技術の教科書を開発する、ということは、あまりにもタイト過ぎる計画であったことは、JICAとして反省すべきであろう。

(2) 20校への拡充計画について

産業オートメーション技術学科の新設が、産業界からの強い要請によって、全国的に一層の普及をさせることが既に、国民教育省で決定されている。このために、10校では、既に2005年9月より新学科が開設されており、更に2006年9月には、更に10校が開設される予定である。このたび支援したイズミールおよびコンヤの両プロジェクトにおける成果を基礎として、これら20校へ、これらの指導技術が円滑に発展拡充されることを期待する。

(3) 教員養成センターについて

先の20校拡充のためには、さしあたり、約300名の優れた技術系教官が必要となり、これら教官の育成が緊急の課題となっている。その為、国民教育省は2004年12月に教員養成センターの建物建設に着手したのであるが、その運営体制、研修計画、等が明確になっていない。この点の対処がトルコ国民教育省には至急求められている。

(4) 20校拡充、教員養成センター建設のための資金について

20校拡充には、その機材費だけで、邦貨換算で約20億円を要すると思われる。これに教員養成センターでの機材費と、全般的なエンジニアリング経費とを加えると、全体的には、23億円程度の資金が必要であろう。これらをどう調達するかは、トルコ政府にとって大きな問題であるが、いずれにしろ、一応この資金を調達するためにフィージビリティ調査を早期に実施し、今後いかなる資金調達にも対応可能なような準備が、トルコ国民教育省として肝要と思う。現在、この件に関しては、JICAとして、ある程度の支援をする方向で、取り運び中である。

6 主な実績と成果の記録

(3) Provision of Equipment 供与機材

JFY / Place of Purchase		2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	
Equipment	Provision	Japan	Diksc Grinder, Jig Saw, Vise, Electric Drill, Rivetting Tool, Height Gauge, GAL Programmer, PLD Programming Training Kit, DSP Stater Kit, PC, Video Recorder, Digital Video Camera, DVE Video Recorder, Digital Camera, LCD Projector, Screen, Parts Box, Oscilloscope, Regurated DC Power Supply, Function Generator, Frequency Comnuter, Digital Multimater, Etching Device, E.T.C.	PLC Basic Trainig Set, Sequence Trainig Set, Robot Control Training System, FA Load unit, PC Board, Factory Web Server, Template, Cutter, Microcomputer Kit, Software, Screen, Digital Storage Oscilloscope, LCR Meter, Regulated DC Power Supply, Variable Capacitor, Variable Self Inductor, Variable Resistor, Voltmeter, Earth Tester, Insulation Tester, Frequency Counter, E.T.C.	Basic PLC Training Set, Robot Control Training System, Robot Remote Control Module, Ciruit Board Manufacturing Machine, PLD Training Set, Micro-Lathe Machine, Micro-Milling Machine, Warehouse Module, Test Module, Prossessing Module, Sequence Trainig Set, Basic Unit, Sequence Control Training System, Variable Capacitor, E.T.C.	Load Training Unit, PLC Control Unit, Color Touch Panel Operation Unit, Elevator Signaler Unit, Mini FA Load Unit, PC for Controller, Modeling Machine Set, CNC Lathe System, DSP Starter Kit, Linux Server	Ammeter, Voltmeter, Module Type FA Control Automation Training System, Elevator Signaler Unit, Basic PLC Training Set
		Total(A)	¥46,500,811	¥193,859,923	¥20,450,416	¥42,134,028	¥7,077,000
	Turkey	PC, Laser Printer, Digital Camera, CCD Camera, Scanaer, Pocket Computer, Multi Media Server, Lathmachine, Drilling Machine, Grinder, Drawing Table, E.T.C.	PC for Sutudents, Server, Network Switch, Lasre Printer, Projector, UPS E.T.C.	Computers for IPD & DSP(16), Computer Shadow DV Yellow MV08, Shadow Hobby MV08	N/A	Projector	
		Total(B)	\$504,926.00	\$198,177.00	\$22,539.00	\$0.00	\$4,612.00

J- Total(A) ¥310,022,178

\$2,980,982.48

T- Total(B) \$730,254.00

¥75,946,416

Total(A)+(B)

Yen ¥385,968,594

USD \$3,711,236.48

(3) Provision of Equipment 供与機材

(4) Local Cost 現地活動費

(4) Local Cost 現地活動費

現地活動費 Budget/J-Fiscal Year	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006	Total
日常的経費 Current Expense	¥8,462,000	¥8,142,000	¥8,665,000	¥12,433,000	¥11,582,000	¥37,702,000
夏季技術セミナー開催費 Technical Seminar Expense	¥0	¥1,524,000	¥2,575,000	¥3,167,000	¥3,075,000	¥7,266,000
合計 Total	¥8,462,000	¥9,666,000	¥11,240,000	¥15,600,000	¥14,657,000	¥44,968,000

* 2002/2003 Brake Down of Technical Seminar Expense

(1) PLC-1	¥538,000
(2) Programming-1	¥472,000
(3) PIC-1	¥514,000
	¥1,524,000

* 2003/2004 Brake Down of Technical Seminar Expense

(1) PLC-2	¥655,000
(2) Programming-2	¥438,000
(3) Network-1	¥811,000
(4) PIC-2	¥671,000
	¥2,575,000

* 2004/2005 Brake Down of Technical Seminar Expense

(1) PLC-3	¥826,000
(2) Programing-3	¥418,000
(3) Network-2	¥752,000
(4) PIC-3	¥733,000
(5) Logical Circuit-1	¥438,000
	¥3,167,000

* 2005/2006 Brake Down of Technical Seminar Expense

(1) PLC-4	¥843,000
(2) Programming-4	¥519,000
(3) Network-3	¥912,000
(4) PIC-4	¥801,000
	¥3,075,000

* Japanese Fiscal Year: From April 1 to March 31

(5) Technical Seminar 夏季技術セミナー

Subject		IZMIR			KONYA			Contents
		Date & Time		Number of Participants	Date & Time		Number of Participants	
2002	PLC 1	2003.02.03-02.04	09:00-16:00	20	2003.02.06-02.07	09:00-16:00	20	Outline of PLC, Programming, Programming application, Practice
	Programming 1	2002.06.17-06.18	09:00-16:30	28	2002.06.22-06.23	09:00-16:30	30	Excel VBA (Basic operation and programming)
	PIC 1	2002.06.19-06.21	09:00-16:30	23	2002.06.24-06.26	09:00-16:30	23	Practice substrate making, Assembler, LED control, Practice device introduction
2003	PLC 2	2003.07.21-07.25	09:00-16:30	14	2003.08.04-08.08	09:00-16:30	11	Outline of PLC, Programming, Programming application, Practice
	Programming 2	2003.07.07-07.11	09:00-16:30	19	2003.07.14-07.18	09:00-16:30	9	Excel VBA (Basic operation and programming)
	Network 1	2003.08.04-08.08	09:00-16:30	17	2003.07.21-07.25	09:00-16:30	18	Network setting, OSI TCP/IP model, Ethernet packet, routing, IP packet, ICMP packet, Transport
	PIC 2	2003.07.14-07.18	09:00-16:30	22	2003.07.07-07.11	09:00-16:30	23	Practice substrate making, Assembler, Stepping motor control, DC motor control
2004	PLC 3	2004.07.12-07.16	09:00-16:00	19	2004.07.05-07.09	09:00-16:00	18	Outline of PLC, Programming, Programming application, Practice
	Programming 3	2004.07.12-07.16	09:00-16:00	19	2004.07.05-07.09	09:00-16:00	18	Excel VBA (Basic operation and programming)
	Network 2	2004.07.05-07.09	8:30-13:00	18	2004.07.12-07.16	09:00-16:00	14	Network setting, OSI TCP/IP model, Ethernet packet, routing, IP packet, ICMP packet, Transport
	PIC 3	2004.07.05-07.09	8:30-13:00	18	2004.07.12-07.16	09:00-16:00	21	Practice substrate making, Assembler, Stepping motor control, DC motor control
	Logic circuit 1	2004.07.05-07.09	8:30-13:00	22	2004.07.12-07.16	09:00-16:00	14	Substrate making and practice Switch input unit · LED input unit Stitch input unit(chattering delete type) · 7 seg LED input unit
2005	PLC 4	2005.7.4-05.7.8	09:00-15:00	21	2005.7.11-05.7.15	09:00-16:00	16	Outline of PLC, Programming, Programming application, Practice
	Programming 4	2005.7.11-05.7.15	09:00-14:30	19	2005.7.4-05.7.8	09:00-15:00	17	Excel VBA (Basic operation and programming)
	Network 3	2005.7.11-05.7.15	09:00-14:30	15	2005.7.4-05.7.8	09:00-15:00	19	Network setting, OSI TCP/IP model, Ethernet packet, routing, IP packet, ICMP packet, Transport
	PIC 4	2005.7.4-05.7.8	08:30-15:00	16	2005.7.11-05.7.15	09:00-15:00	18	Practice substrate making, Assembler, Stepping motor control, DC motor control

Sub Total(A) 310

Sub Total(B) 289

Grand Total((A)+(B)) 599

(5) Technical Seminar 夏季技術セミナー

(6) Production of textbook (Trial version) 開発テキスト一覧

[Grade] Subject	Person of charge	Izmir (IE)	Izmir (IM)	Konya	Situation	Remarks
(1)[9th]Basic practice of industrial works	Ishida / Murakami	Sedat	Hasan	Ibrahim	100%	Translated by Selim(Izmir)
(2)[9th]Industrial mathematics	Yamauchi / Masuda / Suzuki	Guliz	Mehmet	Melek	100%	Translated by Hasan(Izmir) and Yuksel(KONYA)
(3)[9th]Basic practice of information technology	Toyama / Okubo / Arai	Mehmet	Sedat	Osuman	100%	Translated by Yuksel(KONYA)
(4)[9th]Technical drawing	Teramoto / Yuzawa / Nakabeppu	Mehmet	Murat	Osman	100%	Existing Turkish textbook will be used because of technical symbols.
(5)[10th]Microcomputer Technology	Teramoto / Yuzawa / Nakabeppu	Selim	Musutafa.G	Melek	100%	Translated by Turgay(Izmir)
(6)[10th]Electricity & electronics technology	Yamauchi / Masuda / Suzuki	Selim	Hasan	Osman	100%	
(7)[10th]Industrial machinery	Ishida / Murakami	Turgay	Mustafa.G	Yuksel	100%	
(8)[10th]Computer aided design and manufacturing	Toyama / Okubo / Arai	Mustafa.G	Guliz	Melek	100%	
(9)[10th]Industrial mathematics	Yamauchi / Masuda / Suzuki	Hasan	Guliz	Yuksel	100%	
(10)[11th]Computer Control Technology	Ishida / Murakami	Gurcan.B	Gurcan.C	Yuksel	100%	
(11)[11th]Computer Network	Masuda / Suzuki	Gurcan.C	Kahraman	Ibrahim	100%	
(12)[11th]Mechatronics	Yuzawa / Nakabeppu	Gurcan.B	x	Osman	100%	
(13)[11th]Sequence Control Technology	Okubo / Arai	x	Kahraman	x	100%	
(14)[12th]Industrial management	Okubo / Arai	Guliz	Guliz	Melek	100%	
(15)[12th]Technical English	Okubo / Arai	Mehmet	Mehmet	Murat	100%	
(16)[12th]Feed back control	Yuzawa / Nakabeppu	Unal	Murat	Israfil	--	Existing Turkish textbook will be used. Practice textbook was developed.
(17)[12th]FA Robot technology	Murakami	x	Murat	x	100%	
(18)[12th]CNC working	Murakami	x	Hasan	x	100%	
(19)[12th]Automatic production technology	Murakami	x	Mustafa.G	x	100%	
(20)[12th]FA cell control / [12th]FA system technology	Okubo / Arai	x	Telat	x	100%	
(21)[12th]Sequence control technology	Okubo / Arai	Kahraman	x	Osman	100%	
(22)[12th]Industrial product design	Yuzawa / Nakabeppu	Mustafa.N	x	Murat	100%	
(23)[12th]Programming logic device	Yuzawa / Nakabeppu	Selim	x	Osman	100%	
(24)[12th]Digital signal processing	Yuzawa / Nakabeppu	Mustafa.N	x	Melek	100%	
(25)[12th]Network server and security	Masuda / Suzuki	Bulent	x	Yavuz	100%	
(26)[12th]Network system	Masuda / Suzuki	Unal	x	Yuksel	100%	
(27)[12th]Web system technology	Masuda / Suzuki	Bulent	x	Yavzu	100%	
(28)[12th]Project study	Arai / Murakami / Nakabeppu / Suzuki	Mustafa.N / Selim / Bulent / Unal	Kahraman / Telat / Hasan / Musutafa.G	Murat / Osman / Yavuz / Yuksel	100%	Translated by Ahmet(Izmir) and Ismail(Izmir)

Remarks;

This shade part shows name of translators. Translator is not only one CP for each subject but several translators are attached to some subjects.

Production of textbook (First Edition) 開発テキスト一覧

[Grade] Subject	Person of charge	Situation	Remarks
(1)[9th]Basic practice of industrial works	Ishida / Murakami	100%	
(2)[9th]Industrial mathematics	Yamauchi / Masuda / Suzuki	100%	
(3)[9th]Basic practice of information technology	Toyama / Okubo / Arai	100%	
(4)[9th]Technical drawing		100%	
(5)[10th]Microcomputer Technology	Teramoto / Yuzawa / Nakabeppu	100%	
(6)[10th]Electricity & electronics technology	Yamauchi / Masuda / Suzuki	100%	
(7)[10th]Industrial machinery	Ishida / Murakami	100%	
(8)[10th]Computer aided design and manufacturing	Toyama / Okubo / Arai	100%	
(9)[10th]Industrial mathematics	Yamauchi / Masuda / Suzuki	100%	
(10)[11th]Computer Control Technology	Ishida / Murakami	100%	
(11)[11th]Computer Network	Masuda / Suzuki	100%	
(12)[11th]Mechatronics	Yuzawa / Nakabeppu	100%	
(13)[11th]Sequence Control Technology	Okubo / Arai	100%	
(14)[12th]Industrial management	Okubo / Arai	50%	
(15)[12th]Technical English	Okubo / Arai	50%	
(16)[12th]Feed back control	Yuzawa / Nakabeppu	0%	Existing Turkish textbook will be used. Practice textbook was developed.
(17)[12th]FA Robot technology	Murakami	50%	
(18)[12th]CNC working	Murakami	100%	
(19)[12th]Automatic production technology	Murakami	100%	
(20)[12th]FA cell control / [12th]FA system technology	Okubo / Arai	100%	
(21)[12th]Sequence control technology	Okubo / Arai	100%	
(22)[12th]Industrial product design	Yuzawa / Nakabeppu	100%	
(23)[12th]Programming logic device	Yuzawa / Nakabeppu	100%	
(24)[12th]Digital signal processing	Yuzawa / Nakabeppu	100%	
(25)[12th]Network server and security	Masuda / Suzuki	100%	
(26)[12th]Network system	Masuda / Suzuki	100%	
(27)[12th]Web system technology	Masuda / Suzuki	100%	
(28)[12th]Project study		0%	

Production of practice textbook 開発テキスト一覧

[Grade] Subject	Person of charge	Situation	Remarks
(1)[9th]Basic practice of industrial works	Ishida / Murakami	100%	
(2)[9th]Industrial mathematics	Yamauchi / Masuda / Suzuki		No practice
(3)[9th]Basic practice of information technology	Toyama / Okubo / Arai	--	Combined with it's textbook
(4)[9th]Technical drawing		--	Ditto
(5)[10th]Microcomputer Technology	Teramoto / Yuzawa / Nakabeppu	100%	
(6)[10th]Electricity & electronics technology	Yamauchi / Masuda / Suzuki	100%	
(7)[10th]Industrial machinery	Ishida / Murakami	100%	
(8)[10th]Computer aided design and manufacturing	Toyama / Okubo / Arai	100%	
(9)[10th]Industrial mathematics	Yamauchi / Masuda / Suzuki		No practice
(10)[11th]Computer Control Technology	Ishida / Murakami	--	Combined with it's textbook
(11)[11th]Computer Network	Masuda / Suzuki	--	Ditto
(12)[11th]Mechatronics	Yuzawa / Nakabeppu	--	Ditto
(13)[11th]Sequence Control Technology	Okubo / Arai	100%	
(14)[12th]Industrial management	Okubo / Arai	--	Combined with it's textbook
(15)[12th]Technical English	Okubo / Arai	--	Combined with it's textbook
(16)[12th]Feed back control	Yuzawa / Nakabeppu	100%	
(17)[12th]FA Robot technology	Murakami	--	Combined with it's textbook
(18)[12th]CNC working	Murakami	--	Ditto
(19)[12th]Automatic production technology	Murakami	--	Ditto
(20)[12th]FA cell control / [12th]FA system technology	Okubo / Arai	--	Ditto
(21)[12th]Sequence control technology	Okubo / Arai	100%	
(22)[12th]Industrial product design	Yuzawa / Nakabeppu	--	Combined with it's textbook
(23)[12th]Programming logic device	Yuzawa / Nakabeppu	--	Ditto
(24)[12th]Digital signal processing	Yuzawa / Nakabeppu	--	Ditto
(25)[12th]Network server and security	Masuda / Suzuki	--	Ditto
(26)[12th]Network system	Masuda / Suzuki		No practice
(27)[12th]Web system technology	Masuda / Suzuki	--	Combined with it's textbook
(28)[12th]Project study		--	Ditto

Production of teacher's manual 開発テキスト一覧

[Grade] Subject	Person of charge	Situation	Remarks
(1)[9th]Basic practice of industrial works	Ishida / Murakami	100%	
(2)[9th]Industrial mathematics	Yamauchi / Masuda / Suzuki	100%	
(3)[9th]Basic practice of information technology	Toyama / Okubo / Arai	100%	
(4)[9th]Technical drawing		100%	
(5)[10th]Microcomputer Technology	Teramoto / Yuzawa / Nakabeppu	100%	
(6)[10th]Electricity & electronics technology	Yamauchi / Masuda / Suzuki	100%	
(7)[10th]Industrial machinery	Ishida / Murakami	100%	
(8)[10th]Computer aided design and manufacturing	Toyama / Okubo / Arai	100%	
(9)[10th]Industrial mathematics	Yamauchi / Masuda / Suzuki	100%	
(10)[11th]Computer Control Technology	Ishida / Murakami	100%	
(11)[11th]Computer Network	Masuda / Suzuki	100%	
(12)[11th]Mechatronics	Yuzawa / Nakabeppu	100%	
(13)[11th]Sequence Control Technology	Okubo / Arai	100%	
(14)[12th]Industrial management	Okubo / Arai	100%	
(15)[12th]Technical English	Okubo / Arai	100%	
(16)[12th]Feed back control	Yuzawa / Nakabeppu	100%	
(17)[12th]FA Robot technology	Murakami	100%	
(18)[12th]CNC working	Murakami	100%	
(19)[12th]Automatic production technology	Murakami	100%	
(20)[12th]FA cell control / [12th]FA system technology	Okubo / Arai	100%	
(21)[12th]Sequence control technology	Okubo / Arai	100%	
(22)[12th]Industrial product design	Yuzawa / Nakabeppu	100%	
(23)[12th]Programming logic device	Yuzawa / Nakabeppu	100%	
(24)[12th]Digital signal processing	Yuzawa / Nakabeppu	100%	
(25)[12th]Network server and security	Masuda / Suzuki	100%	
(26)[12th]Network system	Masuda / Suzuki	100%	
(27)[12th]Web system technology	Masuda / Suzuki	100%	
(28)[12th]Project study		--	Combined with it's textbook

Minutes of 1st Joint Coordination Committee (JCC)

The JCC was held on June 5, 2002 in Izmir Ege Palas Hotel.

I. Attendance

1. Turkish Side

(1) Ministry of National Education

- Mr. Naim DURMAZ : Director General of Technical & Vocational Education Directorate
Mr. İsmet NİŞANCI : Deputy Director General
Mr. Yücel YÜKSEL : Head of Department
Mr. Cengiz İŞSEVER : Head of Department
Mr. İbrahim DEMİRER : Director of International and Bilateral Projects Section

(2) State Planning Organization

- Mr. İlyas ÇAKIR : Specialist, Technical & Vocational Education Department

(3) Aegean Region Chamber of Industry

- Mr. Nuri ATİK : Member of Aegean Region Chamber of Industry
Mr. Bahadır GEZİCİOĞLU : Member of Aegean Region Chamber of Industry

(4) Anatolian Technical High School (ATHS)

- Mr. Satı ÇALIŞKAN : School Director, İzmir Mazhar Zorlu ATHS
Mr. Muzaffer APAN : School Director, Konya Adil Karaağaç ATHS
Mr. Turgay İŞBİLEN : Counterpart, İzmir Mazhar Zorlu ATHS
Mr. Egemen DÖĞER : Counterpart, İzmir Mazhar Zorlu ATHS
Ms. Güliz GÜLSEVİN : Counterpart, İzmir Mazhar Zorlu ATHS
Mr. Mustafa GÜNEŞ : Counterpart, İzmir Mazhar Zorlu ATHS
Mr. Hasan YILDIZ : Counterpart, İzmir Mazhar Zorlu ATHS
Mr. Selim GÜLÇEN : Counterpart, İzmir Mazhar Zorlu ATHS
Ms. Melek TOTAN : Counterpart, Konya Adil Karaağaç ATHS
Mr. Osman KÖSE : Counterpart, Konya Adil Karaağaç ATHS
Mr. Yüksel ÇINAR : Counterpart, Konya Adil Karaağaç ATHS

2. Japanese Side

(1) Embassy of Japan

- Mr. Yuichi ODAWARA : Second Secretary, Embassy of Japan

(2) JICA Turkey Office

- Mr. Yasushi INABA : Resident Representative, JICA Turkey Office
Ms. Esra DORA : Administrative Officer, JICA Turkey Office

(3) Project Consultation Team

- Mr. Yoshio SATO : Team Leader, The Project Consultation Team
(Senior Curriculum Specialist, Elementary and Secondary Education Bureau, Ministry of Education, Culture, Sports, Science and Technology, Japan)
Mr. Michiakira KATO : Counterpart Training, The Project Consultation Team
(Principal, Takasaki Technical High School, Gumma Prefecture, Japan)

Mr. Takeshi MATSUYAMA: Cooperation Planning, The Project Consultation Team
(Second Development Cooperation Division, Social
Development Cooperation Department, JICA)

(4) JICA Project Team

Mr. Yasuo SUZUKI : Chief Advisor, JICA Project Team
Mr. Satoshi TOYAMA : Expert, JICA Project Team
Mr. Yasuhiro ISHIDA : Expert, JICA Project Team
Mr. Tomizo YAMAUCHI : Expert, JICA Project Team
Mr. Koshi TERAMOTO : Expert, JICA Project Team
Mr. Jin KOKI : Project Coordinator, JICA Project Team
Ms. Ayten IVERSON : Project Secretary, JICA Project Team
Ms. Neslihan KARAÇUHA : Project Secretary, JICA Project Team

II. Business

Mr. DURMAZ, Chairman of JCC, opened the committee at 14:00. The main purpose of the committee is to review the 1st year's project activities and discuss the future plan of operation.

1. Self-introduction of all participants

2. Greetings

(1) Mr. ODAWARA, Second Secretary, Embassy of Japan, put emphasis on below mentioned subjects in his speech.

- a. Necessity of good technical and vocational education system to Turkey
- b. Importance of public relations activities by both sides

(2) Mr. SATO, Team Leader, The Project Consultation Team, put emphasis on below mentioned subjects in his speech.

- a. Importance of close partnership between the technical & vocational schools and the related industries
- b. Conversion of teaching method, that is, change the students form "Understand" to "Can Do" and produce the "Concrete Work Production" rather than "Castle in the Air"

3. Keynote Speech

The Chairman put emphasis on below mentioned subjects in his speech.

- a. The development of the country is depends on the effective usage of resources.
- b. For the reason above, "well-trained technical human resources" are urgently needed in this country.
- c. The Government of Republic Turkey emphasizes the technical & vocational education sector continuously.
- d. The project outputs should be disseminated to other technical and vocational high schools by the way of "In Service Training" and etc.

4. Inputs by Turkish side (FY2001 / 2002)

Mr. YÜKSEL, Head of Department, Ministry of National Education, made a presentation and below is the summary.

(1) 2 Sub-Departments in Project Center (Izmir), "Information Mechanics" & "Information Electronics", and 1 Sub-Department in Cooperation Site (Konya), "Information Electronics", were established.

(2) Total 17 laboratories and workshops, 9 in Project Center (Izmir) and 8 in Cooperation Site (Konya), were modified.

- (3) All the laboratories and workshops were equipped with basic educational furniture, workbenches, electric wiring, free access floor, and air conditioners.
- (4) The total amount of 354,000,000,000 Turkish Liras (TL) is allocated to the both sites. The detail breakdown is as follows.
 - a. Modification

Project Center (Izmir)	;	106,000,000,000 TL
<u>Cooperation site (Konya)</u>	<u>;</u>	<u>84,000,000,000 TL</u>
Sub Total	:	190,000,000,000 TL
 - b. Furnishing

Project Center (Izmir)	;	91,000,000,000 TL
<u>Cooperation site (Konya)</u>	<u>;</u>	<u>63,000,000,000 TL</u>
Sub Total	:	154,000,000,000 TL
 - c. Additional Budget; 10,000,000,000.TL (for the Project Center (Izmir))
- (5) Total 9 technical teachers, 6 for Project Center (Izmir), 3 for Cooperation Site (Konya), were officially assigned as Counterpart.
- (6) By the effort of the both sides, for the purpose of reviewing the project activities, “Project Progress Meeting (PPM)” was set up. It was held in every two months at Izmir, Konya, and Ankara by turns.

Concerning the Counterpart assignment, Mr. DURMAZ, Project Director, added below points.

- a. Technical teachers who assigned to the project as “Counterpart” on 2001/2002 academic years, to receive technology transfer from the JICA Experts, is exempted from deliver the lectures.
- b. The assignment above is go against the Turkish regulations so that the Ministry of National Education keep studying to restructure the regulation for the convenience of these kinds of projects in Turkey.
- c. Once the regulation has been restructured, necessary number of counterpart for the project, on a permanent duty bases, will be secured for the entire period of the project.

5. Inputs by Japanese side (JFY2001 / 2002)

Mr. YAMAUCHI, Expert, JICA Project Team, made a presentation by using attached document1 and below is the summary.

(1) Roles of JICA Long Term Expert

The 4 JICA Long Term Experts mainly played following roles.

- a. Support the design and supervising of the laboratory modification
- b. Finalize the curriculum and syllabus of the department
- c. Develop the textbooks and teaching guides which based on the syllabus
- d. Conduct the technology transfer concerning on the textbooks and guides

(2) Installation of the educational equipment

The equipment that mainly utilize for the subjects on 9th and 10th grade has been procured by JICA. The major equipment is as follows.

- a. Electronic parts, semi - conductor, etc., and measuring equipment of electronic works
- b. Machines for basic mechanical work
- c. Computer facilities for the multi-media works

(3) JICA Counterpart Training

The 6 months training for the 4 Counterparts has been conducted in Japan. The comments to the training from the JICA Project Team are as follows.

- a. The training term, 6 month, was suitable.
- b. After the training, motivation of the 4 Counterparts is remarkably improved.
- c. As a result, it can be said that the training was successful.

Concerning the JFY2002/2003 training, there is a necessity that the Counterparts who have knowledge on Electronics should take “Basic Mechanics Oriented” training, in reverse, the Counterparts who have knowledge on Mechanics should take “Basic Electronics Oriented” training.

(4) Cooperation by the JICA Short Term Expert

The 4 JICA Short Term Expert were dispatched in the below mentioned fields.

- a. “Japanese educational system and activities of technical high schools in Japan”
- b. “Sumo Robot development and assembling”
- c. “Web page development and computer server configuration technology”
- d. “Programming of the Visual Basic”

Concerning the JFY2002/2003 Short Term Expert, cooperation to the “Digital Textbook Development” and “Teacher’s Training System Development” will be put in consideration.

(5) Technology Transfer to the Konya school

Monthly schedule for the school was planned as follows.

- a. 1st week: 1 or 2 JICA Experts visits the Konya school for technology transfer.
- b. 2nd week: Konya Counterparts comes to the Izmir school to receive technology transfer.
- c. 3rd to 4th week: The Konya Counterparts returns to the school and does the self-study.

By the plan above, total inputs hours to the Konya school by the JICA Experts, from June 2001 to May 2002, became 163 man-date. 13.6 man-date per month is the average activity hours to the Konya School.

(6) Syllabus of 9th grade subjects

The syllabus of 9th grade subjects which shown in the attached document 1, page 9 and 10, were developed by the JICA Expert. These subjects are connected to further advanced subjects of 11th and 12th grades. The syllabus of 9th grade is focusing in the following fields.

- a. Technical mathematics
- b. Electricity and electronic basics
- c. Operation of computer and its software
- d. Mechanical works

6. Plan for the JFY2002/2003

Mr. SUZUKI made a presentation by using attached document 1 and below is the summary.

(1) Technology transfer plan of the 5-project year.

During 5 project-year, the JICA Expert will develop textbooks and teacher’s guides of 31 technical subjects. All Counterparts, during 5-project year, are scheduled to receive the technology that related to the said subjects. The average numbers of the subjects are 10 per person.

(2) Equipment installation plan for the JFY2002/2003

JFY2001/2002, around 30 % of total projected amount were procured by JICA. JFY2002/2003, remaining 70 % of total projected amount are expected to be procured and installed. Concerning the provision of equipment, well operation and maintenance are needed.

(3) Technology transfer process to Counterparts

The technology transfer process to the Counterparts is to take following steps.

- a. 1st step; Counterparts are trained by the JICA Expert as an assistant lecturer for 11 months in Turkey.
- b. 2nd step; Counterparts are participate to JICA Counterparts training program in Japan for 6 to 7 months.
- c. 3rd step; After returning from the training, Counterparts are trained by the JICA Expert, for 5 months, to be a regular lecturer.

It takes 2 years for the counterparts to be a regular lecturer.

(4) Practice ratio of 9th and 10th grade subjects

The practice ratios of 9th and 10th grade subjects are as follows.

- a. 48% of the 9th grade and 52% of the 10th grade subjects are the practice.
- b. During 4-year technical education period, 50% of total education hours will be the theoretical and remain 50% will be the practice.

(5) Technology dissemination seminars

The technology dissemination through the country is one of the important issues of the project. For that reason, JFY2002/2003, 3 types of technology dissemination seminars are planned. The plan is to invite technical teachers from other schools to the Izmir and Konya school to give a technical training. The topics of the seminars are as follows.

- a. "Computer Programming"
- b. "PIC Microcomputer"
- c. "Basic Sequence Technology by PLC "

Instructors of the seminars will be the Counterparts of the Izmir and Konya school. The JICA Expert will give necessary supports to the instructors.

As a part of the technology dissemination activities, teacher's training system will be introduced. Its structure, scheme, and etc., will be informed in details later.

(6) Relationship with related industries

In order to provide good human resources to the Turkish industry world, close relationship with the related industries is significantly important. On 11th grade, the students are programmed to send the industry for 4 to 6 week apprenticeship. Before sending the students, the Project Team will take close contact with related industries, which mainly located in Izmir and Konya. The Project Team emphasis that the graduated students from the department will have flexible and wide-covered engineering skills so that the students will be able to find their jobs from wider range of industries. Furthermore, the Project Team will monitor the needs of the industry and will feedback its results to the curriculum and syllabus.

(7) JICA Counterpart training

For the transition period of the counterparts, from assistant lecturer to regular lecturer, the training program, which mainly held in technical high schools in Japan, is thought of as an important factor. JFY2002/2003, the Project Team proposed training terms of 32 weeks to the JICA Headquarters. Therefore, due to unavoidable circumstances of the technical high schools in Japan, the Project Team were faced to shortening the term to 16 weeks. The definite term will be informed soon.

Concerning the above (6) "Relationship with the related industry" a question and a opinion were arisen from Mr. GEZİCİOĞLU, Member of Aegean Region Chamber of Industry and the Project Team replied as follows.

a. Question-1: Concerning the process, which is shown on page 18, after all process has been taken to build up the relation with the industries, what will be the indicators to measure the achievements?

Answer: First, the degree of satisfaction, which the related industries have for the students who completed the apprenticeship. Second, the degree of satisfaction, which the students who completed the apprenticeship have for the related industries.

b. Question-2: It is too late to start the apprenticeship from 11th grade.

Answer: The starting grade and timing of the apprenticeship will be reviewed after having the surveys of the needs of industries.

7. Presentation by Tokyo side

Mr. MATSUYAMA gave some comments and made a presentation on below mentioned subjects.

(1) JICA Counterpart Training

- a. It is strongly requested to the 4 Counterparts, those who successfully completed the training in Japan, to continue their attitude to obtain more technology from the JICA Expert.
- b. The same efforts and performance are expected to come up from Counterparts those who planned to come to Japan in JFY2002/2003.
- c. For the training term of JFY2002/2003, there is a necessity to make some adjustments with relevant technical high schools in Japan. As soon as the term defined, it will be informed to the Turkish side.

(2) Monitoring of Project Activities

The "Monitoring System" has been introduced to the project to monitor the progress of activities. The details are shown in attached document-2. Both sides confirmed the necessity of collaborative work to the system to carry out a function.

8. Acknowledgement

Mr. Yasushi INABA, Resident Representative, JICA Turkey Office, gave an address of gratitude. In his speech, he puts emphasis on below mentioned subjects.

- (1) Importance of public relations activity by both sides, that is, "Accountability".
- (2) Return of the project outputs to the related industries.

The Chairman of JCC summarized the committee and closed at 17:00. The next JCC will be held at Cooperation Site (Konya).

Attached Document

1. Handout for 1st Joint Coordination Committee (June 5, 2000 in IZMIR)
2. Monitoring of Project Activities

This Minutes, consist of 7 (Seven) pages only, has been signed by following participants as a true record of the meeting.

Mr. Naim DURMAZ
Director General of the
Technical & Vocational
Education Directorate,
Ministry of National Education,
Republic of Turkey

Mr. Yoshio SATO
Team Leader,
Project Consultation Team
Japan International
Cooperation Agency,
Japan

As witness:

Mr. Yasushi INABA
Resident Representative,
JICA Turkey Office

Minutes of 2nd Joint Coordination Committee (JCC)

2nd JCC was held on October 15, 2003 in Izmir-Ege Sağlık Hotel.

I. Attendant

1. Turkish Side

- (1) Ministry of National Education
 - Mr. Hüseyin ACIR : General Director of Technical & Vocational Education
 - Mr. Sami ÖNAL : Board of Education – Section Director
 - Mr. Yücel YÜKSEL : Head of Department, Technical & Vocational Education Directorate
 - Mr. İhsan SAVAŞ : Head of Department, Technical & Vocational Education Directorate
 - Mr. Bayram GÜN : Section Director, Technical & Vocational Education Directorate
- (2) Regional Education Directorate
 - Mr. Ahmet SALGIN : Manager of Technical & Vocational Education Section, Izmir Province-National Education Directorate
- (3) İzmir Industry
 - Mr. Enver OLGUNSOY : President of Education Committee – Aegean Region Chamber of Industry (EBSO)
- (4) Konya Industry
 - Mr. Mustafa KÜÇÜKDERE : Investments and Planning Specialist – Konya Chamber of Industry
- (5) Anatolian Technical High Schools
 - Mr. Satı ÇALIŞKAN : School Director, İzmir Mazhar Zorlu ATHS
 - Mr. Muzaffer APAN : School Director, Konya Adil Karaagaç ATHS
 - Mr. Egemen DÖGER : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Turgay İŞBİLEN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Ms. Güliz GÜLSEVİN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Mustafa GÜNEŞ : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Hasan YILDIZ : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Selim GÜLÇEN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Sedat ELBİR : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Mehmet ARIKAN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Mustafa NAZMAN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Bülent VARDAR : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Talât GÜLER : Counterpart, İzmir Mazhar Zorlu ATHS
 - Ms. Melek TOTAN : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. Osman KÖSE : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. Yüksel ÇINAR : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. Murat AKDOĞAN : Counterpart, Konya Adil Karaagaç ATHS

2. Japanese Side

- (1) JICA Turkey Office
 - Mr. Yasushi INABA : Resident Representative, JICA Turkey Office
 - Mr. Ali BEKİN : Administrative Officer, JICA Turkey Office
- (2) Mid – Term Review Team
 - Mr. Yoshio SATO : Team Leader, Mid – Term Review Team (Senior Curriculum Specialist, Elementary and Secondary Education Bureau, Ministry of Education, Culture, Sports, Science and Technology)

- Mr. Tateo MATSUI : Advice on Material Development, Mid – Term Review Team (Principal, Chiba Prefectural Toso Technical High School)
- Mr. Ayako WATANABE : Researcher, Mid – Term Review Team (Regional Planning International Co., Ltd)
- Mr. Takeshi MATSUYAMA : Cooperation Planning, Mid – Term Review Team (Second Development Cooperation Division, Social Development Cooperation Department, JICA)
- (3) JICA Project Team
- Mr. Yasuo SUZUKI : Chief Advisor, JICA project Team
- Mr. Yasuhiro ISHIDA : Expert, JICA Project Team
- Mr. Yoichi MASUDA : Expert, JICA Project Team
- Mr. Shuichi YUZAWA : Expert, JICA Project Team
- Mr. Tetsuya OKUBO : Expert, JICA Project Team
- Mr. Jin KOKI : Project Coordinator, JICA Project Team
- Ms. Ayten IVERSON : Project Secretary, JICA Project Team
- Ms. Neslihan KARAÇUHA : Project Secretary, JICA Project Team

II. Business

The meeting was opened by Mr. Hüseyin ACIR, chairman, at 10:00.

1. Speech by Chairman

Chairman made a speech, focusing on the importance of industrial development of the country and expected impact from the JICA project department to the industrial development (see attached Doc – 1).

2. Self – Introduction of the Participants

3. Speech by the Industry Side

(1) Izmir Industry

Mr. OLGUNSOY made a speech and below is the summary.

- a. The technical and vocational schools, educating mid – level technical human resources, have importance for the industry of Aegean Region.
- b. EBSO-Education Committee is ready to support the new education system which is established in Izmir Mazhar Zorlu ATHS.
- c. EBSO puts emphasis on introducing the project school to the industry of Aegean Region. In this connection, some meetings were organized at the school and the representatives of the industry were invited to the meetings.
- d. In certain times, articles concerning the project department of Mazhar Zorlu ATHS and its activities are being published in EBSO Magazine, which has 6,000 subscribers among the industry.
- e. A Robot Contest was organized on the occasion of Izmir International Fair-2003 with the cooperation of IZFAŞ (Izmir Fair Organization). Mazhar Zorlu ATHS won 1st prize of the contest.
- f. EBSO is planning to have closer contact with the related industrial companies to introduce the project department students for the factory training, which will start in next summer vacation.
- g. EBSO will also assist the job hunting of the graduates of this department.

(2) Konya Industry

Mr. KÜÇÜKDERE made a speech focusing on the below points.

- a. Konya was a traditional industrial city with lots of grain warehouses, it was industrialized in recent years.
- b. Today, Konya Chamber of Industry has 1,200 members from different sectors.

- c. In Konya, using high technology, automotive spare-parts production is the leading sector. Most well-known customer of the sector is TOYOTA.
- d. CNC machines, mostly made in Japan, Korea or Taiwan, are being used for the production of automotive spare parts.
- e. Konya industry needs well-trained and talented technical human resources. Therefore, Konya industry is willing to accept the graduates from the project department of Adil Karaagaç ATHS.
- f. Konya Chamber of Industry is ready to support the project.

After the above speeches, Chairman stated that the cooperation with the industries of both regions is one of the important points for the job hunting of the graduates.

4. Presentation of Ministry of National Education

Mr. Yücel YÜKSEL made a presentation on the resource inputs by Turkish Government and plans for the future development of the project. Here below are the topics of his presentation (see attached Doc – 2).

- (1) Aim of the project
- (2) Modifications of the laboratories and workshops
- (3) Assignment of the counterparts
- (4) Project Progress Meetings and Introduction of the project
- (5) Impact of the new department to the Turkish industry
- (6) Dissemination of the project

5. Presentation of JICA Project Team

Mr. SUZUKI made a presentation as below.

- (1) Technological activities in the first half of the project period.
 - a. Provision of Equipment

During the first half of the project period, educational equipment with a total amount of 3 million USD was procured and installed to the laboratories and workshops of two project schools.
 - b. Development of Textbooks

Development of total 27 textbooks, which is one of the most important duties of the project team, will be completed during 5 year- project period. 9th and 10th grade textbooks were already developed and trial versions were printed. 11th grade textbooks are now being prepared by the JICA Experts.
 - c. Short – Term Experts

8 short – term experts were dispatched to the Izmir and Konya project schools and supported the practical studies of the Turkish Counterparts.
 - d. Technical Seminars

The aim of technical seminars is to disseminate the new technologies to other technical teachers in Izmir and Konya by the Turkish Counterparts with the supervision of JICA Experts. During the first half of the project period, 7 technical seminars were held. The subjects were Programming, PIC (Peripheral Interface Control), PLC (Programmable Logic Control) and Network, which are the most important fields for the industrial development of Turkey.
 - e. Relationship with the Industry and the Universities

In order to grasp the needs of industry, the needs which are to produce the mid-level technical human resources, some meetings were held with Izmir and Konya’s Chamber of Industry. The project is also in close contact with 4 Turkish Universities, namely Ege University, Dokuz Eylül University, Advanced Technology Institution and Selçuk University. The relationship with the universities will play the key role for updating the textbooks.

- (2) Plan for the latter half of the project period.
 - a. Textbook Development
Development of the remaining 18 textbooks out of 27 will be completed by the JICA Experts and the Turkish Counterparts during the latter half of the project period.
 - b. Factory training and job hunting of the students
Factory training is a good chance to observe the needs and impact of the industries, especially view points of monitoring the educational level and its quality. Therefore, a supporting system for job hunting of the graduates should be established by Turkish side and necessary guidance should be given to the students by the Turkish Counterparts.

6. Presentation of School Directors

(1) Director of Izmir Project School

Here below are the topics of the presentation of Mr. ÇALIŞKAN (see attached Doc – 3).

- a. Long – Term and Short Term expert activities, assignment and activities of the counterparts.
- b. Curriculum and textbook development
- c. Introduction of the project department
- d. Cooperation with the Chamber of Industry, other chambers, universities and other technical high schools.
- e. Installation of the equipment procured from local market and Japan, laboratory activities.
- f. Teachers Training Center Plan and In – Service Training
- g. Success rates of the prep. and 9th grade students in the academic year of 2002–2003.

(2) Director of Konya Project School

Mr. APAN made a presentation focusing on the below points.

- a. After having the introduction of the project activities to the Konya industry and public, high interests were shown, especially from the people, who belong to educational world as well as industry. There are number of teachers and industrial employees, who have children as primary school students, show their strong willingness to send their child to our department.
- b. According to the impressions which obtained from the discussions with the industry side, the department students will be hopefully accepted for the factory training.
- c. From the more effective counterparts training point of view, a long – term expert is requested to assign at the Konya school. If it is not possible, long – term experts are requested to stay in Konya for longer period.
- d. Since Konya industry is mostly composed of factories manufacturing hydraulic machines and spare parts, which are based on the mechanical technology, there is a request from the industry side to open the “Information Machinery” sub-department in Adil Karaagaç ATHS.

7. Presentation of Mid-Term Review Team

Mr. SATO, Team Leader, presented the outline of mid-term review including the below topics (see attached Doc – 4).

- (1) Preface
- (2) Objectives of the Review
- (3) Members of JICA Mid – Term Review Team
- (4) Methodology of the Review

Mr. MATSUYAMA explained the Project Design Matrix (PDM) (see attached Doc – 5) and results of the mid – term review (see attached Doc – 6).

8. Questions & Answers and Additional Topics

Mr. ÇALIŞKAN expressed the below points.

- (1) The harmonization between Japanese and Turkish sides, which is the most important factor for the efficiency and effectiveness of the project activities, was obtained through the big efforts of Mr. SUZUKI, Chief Advisor, and other JICA Experts.
- (2) It is known that the assignment period of JICA Expert is handling by JICA headquarters but, if there is a possibility not to replace the existing team members, especially the Chief Advisor, up to the end of the project period, it will give positive effect for the success of the project.

9. Comments from the Resident Representative of JICA Turkey Office

Mr. INABA, Resident Representative of JICA Turkey Office, gave the below comments.

- (1) Turkey is going forward to be an EU member. To realize this, I believe that well organized harmonization studies with EU are necessary.
- (2) As the harmonization studies mentioned above, more importance should be placed on the technical & vocational education sector.
- (3) In the meantime, for the support to the technical and vocational education sector by JICA, Ministry of National Education should study and analyze the contents of the support, giving careful consideration of harmonization process to EU.
- (4) In order to harmonize the JICA Project activities and the EU studies, it is strongly proposed to have further meetings between JICA (Turkey Office) and the Ministry.
- (5) The request, relating the replacement of existing JICA Expert, will be considered by JICA Headquarters.

10. Acknowledgement and Closing

Chairman acknowledged the discussions with the below speech.

- (1) It is obvious from the discussions that the project activities are going on successfully in a well-organized cooperation between Turkish and Japanese sides.
- (2) There are 3 points that need to be stressed.

a. Employment

In order to provide employment to the graduates, a survey was started together with the State Planning Organization (SPO) and State Statistics Institution (SSI). Technical & Vocational General Directorate of Ministry is playing the coordination of the survey. The result of survey will be shared with the Japanese side. With the aim of sending the first graduates to the industry, together with the Japanese side, it is requested not to terminate the project before having the first graduates in 2006.

b. Publicity

To introduce the project activities to the industry and public, more importance should be placed on publicity. To make a common brochure of the both project schools is one of the ideas.

c. Sister School Plan

The review team is requested to form a sister school plan between Turkish and Japanese schools.

The meeting was closed by the chairman at 15:40.

Minutes of the 3rd Joint Coordination Committee (JCC)

The 3rd JCC was held on November 19, 2004 at the Konya Chamber of Industry.

I. Attendees

1. Turkish Side

- (1) Ministry of National Education
 - Mr. Hüseyin ACIR : Director General, Technical & Vocational Education General Directorate
 - Mr. Yücel YÜKSEL : Head of Department, Technical & Vocational Education General Directorate
 - Mr. Sami ÖNAL : Section Director, Board of Education
 - Mr. Abdullah EKİCİ : Section Director, Personnel General Directorate
 - Mr. Birol KALKAN : Section Director, Investments and Facility Department
 - Mr. Suat İYİGÜN : Section Director, Educational Materials & Equipment Department
 - Mr. İbrahim KURT : Section Director, Educational Materials & Equipment Department
 - Mr. Şerafettin CANKURT : Project Section Director, Technical & Vocational Education General Directorate
- (2) State Planning Organization (SPO)
 - Ms. Fatma BARKÇIN : SPO Expert
 - Mr. Katumi UCHIDA : JICA Expert, SPO
- (3) Regional Education Directorate
 - Mr. Mehmet ÖZER : Konya Province National Education Director
 - Mr. Mustafa KOCA : Selçuklu District National Education Director
 - Mr. Muzaffer GÜL : Konya Province National Education Directorate, Section Director
- (4) İzmir Industry
 - Mr. Zekai FİDAN : Member of Education Committee, Aegean Region Chamber of Industry (EBSO)
- (5) Konya Industry
 - Mr. M. Ali KORKMAZ : Deputy President, Konya Chamber of Industry
 - Mr. Mustafa KÜÇÜKDERE : Investments and Planning Specialist (Mechanical Engineer), Konya Chamber of Industry
 - Mr. Mustafa YILDIZ : Factory Manager, ZADE Oil Processing Factory
 - Mr. A. Metin ŞAHİN : R & D Manager, ZADE Oil Processing Factory
 - Mr. Hasan AHAT : Administrative Manager, İMAŞ Machine Industry
 - Mr. İbrahim DİKMEN : Electricity Chief, Konya Cement Factory
 - Mr. Zafer ÇALIŞ : Maintenance and Repair Chief, Selva Food Industry
- (6) Anatolian Technical High Schools
 - Mr. Muzaffer APAN : School Director, Konya Adil karaagaç ATHS
 - Mr. Hilmi DEĞER : School Director, Selçuklu Ind. Voc. HS
 - Mr. Turgay İŞBİLEN : Counterpart, İzmir Mazhar Zorlu ATHS
 - Mr. Kahraman ÖNEY : Counterpart, İzmir Mazhar Zorlu ATHS
 - Ms. Melek TOTAN : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. Osman KÖSE : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. Yüksel ÇINAR : Counterpart, Konya Adil Karaagaç ATHS
 - Mr. İbrahim APA : Counterpart, Konya Adil Karaagaç ATHS

2. Japanese Side

- (1) JICA Turkey Office
 - Mr. Mitsuo NAKAMURA : Resident Representative
 - Ms. Mayumi SAKAMOTO : Assistant Resident Representative
 - Mr. Ali BEKİN : Administrative Officer

- (2) JICA Project Team
 - Mr. Yasuo SUZUKI : Chief Advisor
 - Mr. Yoichi MASUDA : Expert
 - Mr. Shuichi YUZAWA : Expert
 - Mr. Tetsuya OKUBO : Expert
 - Mr. Hideki MURAKAMI : Expert
 - Mr. Jin KOKI : Project Coordinator
 - Ms. Ayten IVERSON : Project Secretary
 - Ms. Neslihan KARAÇUHA : Project Secretary

II. Business

The meeting was opened by Mr. ACIR, chairman, at 10:30.

1. Speech by the Chairman (see attached doc - 1)
2. Speech by Mr. NAKAMURA (see attached doc - 2)
3. Self - Introduction of the Participants
4. Comments to the Project activities from Mr. FIDAN and Mr. KORKMAZ, Representatives of İzmir and Konya Chamber of Industry.
 - (1) In Turkey, industrial development cannot be obtained due to the lack of well trained mid-level technical human resources, especially in operational and maintenance sections.
 - (2) In last 9 months, machines totaling 8 billion USD were imported to Turkey but due to a lack of technical knowledge and suitable human resources, 3 billion USD was spent for Research & Development (R&D) to analyze the imported machines. This amount, 3 billion USD, underscores the lack and importance of technical human resources enhancement.
 - (3) In addition to the “Well Trained Mid-Level Technical Human Resources”, Industry also needs “University Graduated Engineers”. However, the Ministry requested re-arranging the university entrance regulations to create a chance for superior students in the project department.
 - (4) In Konya, Industrial Automation Technology is being widely used in every sector, from production to marketing. Three leading sectors in exportation are the automotive industry, machine production and the food industry.
 - (5) Maintenance, repairing and spare parts services for the machines are supplied by the technical human resources in Konya.
 - (6) The approximate amount of exports from Konya is 1 billion USD per year. To meet the high production demand, technical human resource enhancement is very important. Konya Chamber of Industry is ready to provide support to train the project students.

After receiving comments from the Representatives, chairman emphasized the importance of close cooperation with the industry.

5. Comments to the Project activities from Konya Industry Representatives
 - (1) ZADE is willing to open its facility to the students for internships, especially on PLC applications. However, in order to grasp the exact needs of technical human resource, a feasibility study should be implemented.
 - (2) IMAS, as a machine industry, emphasized the necessity of massive PIC and PLC training. Cooperation between Project Schools and Industry should be put into practice.
 - (3) Konya Cement Factory accepted 3 students in the Electricity-Electronics Department for internships and was satisfied with their technical skills and performance. We believe that the Project department will meet the need to fill the demand for “Well Trained Mid-Level Technical Human Resources”.

- (4) SELVA also needs “Well Trained Mid-Level Technical Human Resources” especially on PLC. Four-week internships should be increased in order to harmonize the theoretical knowledge and practical skill of the students. We suggest that the development of expertise education on PLC, mechatronics, and programming should be strengthened.

6. Project activity review

Mr. YÜKSEL reported the issue as attached doc - 3 and Mr. SUZUKI gave the following comments.

- (1) The 1st internship for the 10th grade students was successfully implemented because of close discussions and preparation together with industry. Comments from the industry side, that 4 weeks is not enough for the internship, should be taken into serious consideration. (Need to discuss in more detail with an eye on each factory's capacity)
- (2) In the 2003 - 2004 academic year, 4 CPs, mainly engaged as 11th grade teachers, were sent to Japan to take a 35 week training (4 weeks Japanese language course, 10 weeks at technical high school and 20 weeks at the National College of Technology or JICA Group Training). At technical high schools, CPs took training on school management and teaching methods. At the National College of Technology or JICA Group Training, higher application technology training was provided.
- (3) In the 2004 - 2005 academic year, 5 CPs were sent to Japan. As of November 2004, they completed the training at the technical high school level and have just started the higher application technology training at the National College or JICA Group Training.

Ms. BARKÇIN noted that with reference to the above presentations, 12th grade textbook development needs more time than the projected period and will affect 12th grade education. Mr. SUZUKI explained the development plan as follows:

- a. For the 9th, 10th and 11th grades, 4 to 5 textbooks for each grade were completed and for the 12th grade, total 19 textbooks including 4 Project Studies need to be completed before September 2005.
- b. Our textbook development plan for the 12th grade is:
 - 5 textbooks out of 19 are already developed by JICA Short Term Experts in July 2004.
 - 5 textbooks out of 19 will be developed by the JICA Short Term Experts who will be invited in 2005.
 - 5 subjects out of 19 will be developed by the JICA Long Term Experts.
 - 4 subjects and the Project Study, are not definite as of yet and are under discussion among the project team.

7. 2005/2006 activity plan for JICA Project Team

Mr. SUZUKI made a presentation closely focused on the Project Study as follows:

- (1) Each implementation step of the Project Study, most important subject of this department, is shown on attached doc – 4.
- (2) Each sub-department is classified into 2 courses and given 6 different topics so there will be total 36 topics among 6 courses.

İzmir Mazhar Zorlu ATHS

*Information Machinery: - Factory Automation Technology Course
- Automatic Production Technology Course*

*Information Electronics: - Product Design Technology Course
- Network Technology Course*

Konya Adil Karaagaç ATHS

*Information Electronics: - Product Design Technology Course
- Network Technology Course*

- (3) The topics which are rooted in the real industrial tasks should be elected through discussions between both the school and industry sides.
- (4) The general idea of the Project Study is almost same as a “Thesis” in university. The difference is the target technical level, our Project Study is more focused on practical tasks.

8. Extension of the JICA Project and further support from JICA

On behalf of the Ministry of National Education, Mr. YÜKSEL gave 2 official proposals to JICA (see attached doc – 5). These are:

- (1) Extension of current JICA project, “3 Years Follow Up Extension”.
- (2) Technical assistance to 2 new projects, namely:
 - a. “Expansion of Industrial Automation Technologies Department to other 20 schools”
 - b. “Establishment of Teachers Training Center (TTC)”
- (3) Implementation duration of the above 2 new projects will be clarified later. The main assistance to the 2 new projects is curriculum and textbook development.

In reference to “Expansion of Industrial Automation Technologies Department to other 20 schools”, Mr. YÜKSEL explained that the opening of the department, in the 2005/2006 academic year at 1st phase 7 expansion schools out of 20, has already been announced to the public.

Mr. BEKİN wondered that if the expansion and TTC project is based on the current JICA Project, how the TTC will be organized before evaluating the current project. Mr. SUZUKI replied that for the meanwhile, TTC can be organized with the output of the current JICA Project which is at a completion rate of 80% curriculum and 50% textbooks. He put emphasis on continuity and harmonization of the current project to the 2 new projects.

Mr. NAKAMURA commented that the requests will be discussed when the JICA Evaluation Mission visits. He expressed a desire for a fruitful completion of the current project.

9. Others

The participants made comments as below.

- (1) State Planning Organization (SPO)
 - a. The monitoring of the graduates is a very important issue to evaluate the project activities.
 - b. The expansion project is already approved and included into the 2004 National Budget Plan by SPO.
 - c. Project Study on the 12th grade is also an important issue for the qualification of the graduates.
- (2) Investments Facility Department (MONE)
 - a. A portion of the building construction for TTC has been approved for organization.
 - b. An amount of 2 trillion 557 billion TL (Approximately 1.7 Million USD) was secured by the Turkish Government and 684 billion TL (Approximately 455 Thousand USD) was already allocated to the Mazhar Zorlu AHS. The construction is expected to start in one to two months.
 - c. In order to complete the construction earlier than projected schedule, an allocation of additional budget has been requested to the SPO.
- (3) Board of Education (MONE)
 - a. Developed curriculum and syllabus for the 9th, 10th and 11th grades by the project team have been submitted to the Board for the official approval.
 - b. When necessity arises, it is still possible to make changes on the curriculum and syllabus since it is a pilot project.
 - c. The curriculum and syllabus for the 12th grade will be submitted to the Board before the end of 2004.
- (4) Personnel General Directorate (MONE)
 - a. The Personnel General Directorate is taking the necessary steps to assign the CPs to the project schools as permanent teachers.
 - b. According to the regulations of the Ministry, assigning the CPs as a teacher in the different field from his or her educational background is not permitted, so the Directorate is planning to change the regulations.
 - c. (In reply to Mr. OKUBO’s question) 2004 - 2005 CP assignment, selection of candidates is made by Technical and Vocational Education Directorate. As soon

as selection is made, their assignment will be done by the Personnel General Directorate.

10. Acknowledgements

The Chairman summarized the committee and adjourned the meeting at 16:00.

Attached Documents:

- Document – 1 : Opening speech by Mr. Hüseyin ACIR, Chairman
- Document – 2 : Speech by Mr. NAKAMURA
- Document – 3 : Speech by Mr. Yücel YÜKSEL (Presentation of last year activities)
- Document – 4 : Outline of Project Study
- Document – 5 : Extension of Project and JICA Support (Mr. YÜKSEL's presentation)

Mr. Hüseyin ACIR
Director General of the
Technical & Vocational Education
General Directorate,
Ministry of National Education,
Republic of Turkey

Mr. Mitsuo NAKAMURA
Resident Representative,
JICA Turkey Office

Minutes of 4th Joint Coordination Committee (JCC)

4th JCC was held on May 27, 2005 in Aegean Region Chamber of Industry (EBSO).

I. Attendees

1. Turkish Side

(1) Ministry of National Education

- Mr. Hüseyin ACIR : Director General of Technical and Vocational Education
Mr. Yücel YÜKSEL : Head of Department, Technical and Vocational Education General Directorate
Mr. I. Hakkı YÖRÜBULUT : Section Manager, Investment and Facilities Department
Mr. İbrahim KURT : Section Manager, Educational Materials and Equipment Department

(2) Regional Education Board

- Mr. Ahmet SALGIN : Section Manager, İzmir Province National Education Directorate

(3) İzmir Industry

- Mr. Mustafa ORHUN : Human Resources Department Chief – EBSO.
Mr. Nadir ERDİR : Technical Education Committee Member – EBSO.
Mr. Zekai FİDAN : Technical Education Committee Member – EBSO.

(4) Konya Industry

- Mr. M. Serkan KANARYA : Quality Assurance Specialist – Konya Chamber of Industry

(5) Anatolian Technical High Schools

- Mr. Muzaffer APAN : School Director, Konya Adil Karaağaç ATHS
Mr. Satı ÇALIŞKAN : School Director, İzmir Mahzar Zorlu ATHS
Mr. Turgay İŞBİLEN : Deputy School Director, İzmir Mahzar Zorlu ATHS
Mr. Murat ÖZDEVECİ : Counterpart, İzmir Mahzar Zorlu ATHS
Ms. Güliz GÜLSEVİN : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Gürcan BILDIR : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Gürcan ÇAYIR : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Selim GÜLÇEN : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Kahraman ÖNEY : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Bülent VARDAL : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Telat GÜLER : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Mustafa NAZMAN : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Ünal SEVİM : Counterpart, İzmir Mahzar Zorlu ATHS
Mr. Mehmet ARIKAN : Counterpart, İzmir Mahzar Zorlu ATHS

2. Japanese Side

(1) Japan Embassy

- Mr. Toshiyuki MOMMA : Second Secretary

(2) JICA Turkey Office

- Mr. Mitsuo NAKAMURA : Resident Representative
Ms. Mayumi SAKAMOTO : Assistant Resident Representative
Mr. Ali BEKİN : Administrative Officer

- (3) Final Evaluation Mission
- Mr. Motoharu WATANABE : Mission Leader, Technical and Higher Education Team, Group2, Human and Development Department, Japan International Cooperation Agency (JICA)
- Mr. Shigeru IKEMORI : Senior Specialist for curriculum, Vocational Education and Information Technology Education Division, Elementary and Secondary Education Bureau, Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- Mr. Tateo MATSUI : Principal, Chiba Prefectural Mobara Technical High School
- Mr. Shinji NAMBO : Senior Representative, Exe.Idea Ltd.
- Mr. Kaido IKEDA : Staff, Technical & Higher Education Team, Group2, Human and Development Department, Japan International Cooperation Agency (JICA)
- (4) State Planning Organization
- Mr. Katsumi UCHIDA : JICA Expert
- (5) JICA Project Office
- Mr. Yasuo SUZUKI : Project Chief Advisor
- Mr. Hideki MURAKAMI : JICA Long Term Expert
- Mr. Hiroshi ARAI : JICA Long Term Expert
- Mr. Hiroshi SUZUKI : JICA Long Term Expert
- Mr. Yuji NAKABEPPU : JICA Long Term Expert
- Mr. Jin KOKI : Project Coordinator
- Mr. Kouichi ITOU : JICA Short Term Expert
- Mr. Shigeru MIYAMOTO : JICA Short Term Expert
- Mr. Motoe IMAI : JICA Short Term Expert
- Ms. Ayten IVERSON : Project Secretary
- Ms. Neslihan KARAÇUHA : Project Secretary

II. Business

The meeting was opened by Mr. SUZUKI at 10:00 a.m. After announcement of the agenda by Mr. Hüseyin ACIR, Chairman of the Committee, the discussions started along the agenda.

1. Opening speech by Director General (see attached document-1)
2. Self introduction of all the participants
3. Speech by JICA Turkey Office – Mr. NAKAMURA (see attached document-2)
4. Speech by JICA Final Evaluation Mission

Here below are the main points of the speech made by Mr. WATANABE, Mission Leader.

- (1) The aim of this Project was to establish the Industrial Automation Technologies Department in two pilot Anatolian Technical High Schools.
- (2) For achieving this aim, a period of 4 years was already completed. Final evaluation results of this period will be presented by one of the mission members during the meeting.

- (3) As a general expression, it was a successful experience for both sides.
- (4) The most impressive point for the evaluation mission was the jointly used teachers room of the Project, which is not usual for the other projects.
- (5) It was observed that this kind of teachers room, which provides close and smooth communication between Japanese experts and Turkish Counterpart, is one of the factors for having successful Project activity results.
- (6) We, JICA Evaluation Team, hopes to continue this kind of cooperations between two governments in future.

5. Guest Speech

- (1) Speech by Japan Embassy – Mr. Toshiyuki MOMMA (see attached document-3)

After the speech of Mr. MOMMA, the Chairman gave some brief information about EU Project.

- a. We, as General Directorate, are working in cooperation with the EU Project Office, mentioned by Mr. MOMMA in his speech.
- b. This year, total 327 projects from Turkey were accepted by the related committee of EU.
- c. Around 3500 people, including 2000 students, are being planned to visit several EU countries.
- d. As we observed from our official visits to several EU countries, most of the EU countries are willing to have cooperation on technical and vocational education field between each other.
- e. It is obviously known that the development of a country depends on the increase of production capacity, and the production capacity can only be increased with the qualified technical human resources.
- f. Above mentioned fact accelerates the EU countries to give more importance to the technical and vocational education.

- (2) İzmir Province National Education Directorate

Mr. Ahmet SALGIN, on behalf of İzmir National Education Directorate, first greeted all the participants and expressed the below points.

- a. We, İzmir National Education Directorate, believe that this Project established a strong bridge between two countries.
- b. It is clear with the annual datas that the JICA Project increased the interest of parents to Mazhar Zorlu ATHS for registering their students to this school.
- c. On the other hand, the comments from industry side are very positive on the educational program of the Project Department, as well as the technical quality of the students.
- d. We know a Japanese expression “The important point is not what the job is, the important point is how to do it”. We, Turkish side, are honored to be included into such an organization, which is completely suitable to that expression.
- e. We hope the continuity of the cooperation with Japan in future.

- (3) Aegean Region Chamber of Industry (EBSO)

Mr. Nadir ERDİR gave the below speech.

- a. I’m an industrialist, working also for EBSO–Technical Education Committee for 7 years, within a close cooperation with the technical and vocational high schools.
- b. EBSO recognized the difference of Mahzar Zorlu ATHS from the other ATHSs with the effective introduction made by school and started to give stronger support rather than the other schools.
- c. Here below are the summary of certain supports given by EBSO.
 - i. We organized National Robot Contest for the last two years with the support of JICA Project Team. Lots of successful projects applied to the Contests, and Mazhar Zorlu ATHS was the winner of 1st Robot Contest.

- ii. In order to be able to modify the educational program by school side with the aim of meeting the industrial needs, the curriculum of Project department was sent to several companies and evaluated on the suitability of the program to the real industrial demands.
- iii. We organized several visits of related industrialists to the school and provided interviews and seminars with the teachers and students.
- iv. We organized visits of school teachers and students to the related companies.
- v. We supported the introduction of school to the industry via local and national press.
- vi. We tried to establish contact between school and companies, with the aim of arranging the factory internship of the students.
- d. Our request to Ministry side is to give a special title and status to the graduates of this school, since they are given higher level technological education for 5 years.
- e. EBSO is always ready to make any kind of support needed by the Project school.

(4) Konya Chamber of Industry

Mr. M. Serkan KANARYA made a speech focusing on below points.

- a. Konya industry is based on machinery, automotive spare parts, plastics and food industries.
- b. We need well talented mid-level technical human resources on these sectors.
- c. Konya industrialists believe that the graduates from Adil Karaağaç ATHS will meet the industrial needs in the region.
- d. The request of Konya industry from Ministry side is to open also the Mechanical Department in Adil Karaağaç ATHS.
- e. Konya Chamber of Industry is always ready to support Project activities.

As a reply to the request from Konya industry, Director General expressed the below points.

- a. The mechanical department will be opened in Konya school and start to accept student in the academic year of 2005-2006.
- b. The only problem is the physical capacity of the school building.
- c. This problem will be solved temporarily by closing one of the existing departments.
- d. On the other hand, in order to solve the building capacity problem permanently, Konya industry is kindly asked to support the construction of an additional school building financially.

6. Project Activity Agenda

(1) Summary of the Project results and further deployment after the Project

Mr. Yücel YÜKSEL made a presentation for this topic (see attached document-4).

(2) Counterpart training results reviews

Mr. SUZUKI presented this topic (see attached document-5), (see attached document-6).

(3) Further assistance request on technical cooperation

Mr. Yücel YÜKSEL made a presentation for this topic (see attached document-7)

(4) Project evaluation by JICA Final Evaluation Mission

Mr. NAMBO presented the final evaluation results of the Project (see attached document-8).

7. Confirmation of JCC Resolutions

Director General stated the below points.

- (1) According to the evaluation results, presented by JICA Final Evaluation Mission, the Project is being carried out successfully.
- (2) Since the vocational education is becoming more important in recent years, the continuity of this kind of projects also gains more importance in Turkey.

- (3) As known, a project on strengthening the vocational education is being implemented by EU Committee.
- (4) First, beneficiaries were only EU countries, but later, the project was opened to the EU candidate countries like Turkey, Romania, Bulgaria, etc.
- (5) Turkey is now working on several studies in scope of this project. The common aim of all these studies is to meet the demand of age and related industrial sector.
- (6) Nowadays, since some countries, such as Japan, Germany, USA, France, etc, establish their manufacturing factories in other countries, vocational education is also becoming important in cultural, economic and strategical point of view.
- (7) For Turkey and Japan, some of the possible ideas for the future cooperation can be;
 - Student and teacher exchanging programs
 - Language training course for the students, who get education in Japanese language (For example Türktelekom Anatolian Technical High School / Ankara)
 - New projects on vocational education, related with Information-Communication Technology, Earthquake and Railway System Technology, etc.
- (8) After a general expression on vocational education mentioned above, 4th JCC can be summarized as the Project was evaluated by the JICA Evaluation Mission on positive results, and the official request of Turkish side from Japan is the extension of the Project as a second phase, including TTC Project and 20 School Expansion Project.

8. Signing the minutes of meeting

9. Acknowledgement

Mr. WATANABE expressed that the JICA Final Evaluation Mission will convey the request of Turkish side for Project extension (second phase) to the concerning Japanese authorities, then added that they will try to arrange the dispatch of some short term experts to Project schools soon after the termination of the Project period in July – August 2006.

Mr. NAKAMURA stated that JICA Turkey Office will continue to cooperate with Ministry of National Education and support the Project.

10. Adjournment

The committee was adjourned by the chairman at 13:00.

Attached Documents:

- Attached document-1 : Speech by Mr. Hüseyin ACIR
- Attached document-2 : Speech by Mr. NAKAMURA,
- Attached document-3 : Speech by Mr.MOMMA
- Attached document-4 : Presentation by Mr. Yücel YÜKSEL
- Attached document-5 : Presentation by Mr. SUZUKI
- Attached document-6 : Counterpart training in Japan (Mr. SUZUKI)
- Attached document-7 : Further assistance request by Turkish side (Mr. YÜKSEL)
- Attached document-8 : Project Evaluation by JICA Final Evaluation Mission (Mr. NAMBO)

	Date & Time	Venue	Agenda	Name List
JCC-1	June 5, 2002 14:00 p.m.	İzmir Ege Palace Hotel	<ol style="list-style-type: none"> 1. Opening by the Chairman 2. Self-introduction of the participants 3. Greetings (by Mr. ODAWARA & Mr. SATO) 4. Speech by Chairman (Director General) 5. Inputs by Turkish side (presentation by Mr. YUKSEL) 6. Inputs by Japanese side (presentation by Mr. YAMAUCHI) 7. Plan for the JFY2002/2003 8. Presentation by Tokyo side 9. Acknowledgement <p>(Summary of each topic can be seen on "Minutes of JCC-1 as attached doc.1)</p>	<ol style="list-style-type: none"> 1. Turkish side <ol style="list-style-type: none"> a. Ministry of National Education b. State Planning Organization c. Aegean Region Chamber of Industry (EBSO) d. Anatolian Technical High Schools 2. Japanese side <ol style="list-style-type: none"> a. Embassy of Japan b. JICA Turkey Office c. Project Consultation Team d. JICA Project Team
JCC-2	Oct. 15, 2003 10:00 a.m.	İzmir Ege Sağlık Hotel	<ol style="list-style-type: none"> 1. Opening speech by the Chairman 2. Self-introduction of the participants 3. Speech by the industry sides <ol style="list-style-type: none"> a. İzmir industry b. Konya industry 4. Presentation of Ministry of National Education 5. Presentation of JICA Project Team 6. Presentation of project school directors 7. Presentation of Mid-Term Review Team 8. Questions & Answers 9. Comments from JICA Turkey Office 10. Acknowledgement <p>(Summary of each topic can be seen on "Minutes of JCC-2 as attached document.2)</p>	<ol style="list-style-type: none"> 1. Turkish side <ol style="list-style-type: none"> a. Ministry of National Education b. Regional Education Directorate c. İzmir industry representative d. Konya industry representative e. Anatolian Technical High Schools 2. Japanese side <ol style="list-style-type: none"> a. JICA Turkey Office b. Mid-Term Review Team c. JICA Project Team

(7) Record of Joint Coordination Committee (JCC) JCC 開催記録

<p>JCC-3</p>	<p>Nov. 19, 2004 10:30 a.m.</p>	<p>Konya Chamber of Industry</p>	<ol style="list-style-type: none"> 1. Opening speech by Chairman 2. Speech of JICA Turkey Office (Mr. NAKAMURA) 3. Self-introduction of the participants 4. Comments from Izmir and Konya Chambers of Industry 5. Comments from Konya industrial company representatives 6. Project activity review (by Mr. YUKSEL) 7. 2005/2006 activity plan for JICA Project Team 8. Extension of the JICA Project and further support from JICA 9. Other <ol style="list-style-type: none"> a. Comments from State Planning Organization b. Comments from Investment Facility Dept. c. Comments from Board of Education d. Comments from Personnel Gen. Directorate 10. Acknowledgement <p>(Summary of each topic can be seen on "Minutes of JCC-3 as attached document.3)</p>	<ol style="list-style-type: none"> 1. Turkish side <ol style="list-style-type: none"> a. Ministry of National Education b. State Planning Organization c. Regional Education Directorate d. Izmir industry representatives e. Konya industry representatives f. Anatolian Technical High Schools 2. Japanese side <ol style="list-style-type: none"> a. JICA Turkey Office b. JICA Project Team
<p>JCC-4</p>	<p>May 27, 2005 10:00 a.m.</p>	<p>Izmir Aegeon Region Chamber of Industry</p>	<ol style="list-style-type: none"> 1. Opening speech by Chairman 2. Self-introduction of the participants 3. Speech of JICA Turkey Office (Mr. NAKAMURA) 4. Speech of JICA Final Evaluation Mission 5. Speeches by the guests <ol style="list-style-type: none"> a. Japan Embassy b. Izmir National Education Directorate c. Aegeon Region Chamber of Industry d. Konya Chamber of Industry 6. Project activity agenda 7. Confirmation of JCC resolutions 8. Signing the minutes of meeting 9. Acknowledgement <p>(Summary of each topic can be seen on "Minutes of JCC-4 as attached document.4)</p>	<ol style="list-style-type: none"> 1. Turkish side <ol style="list-style-type: none"> a. Ministry of National Education b. Regional Education Board c. Izmir industry representatives d. Konya industry representatives e. Anatolian Technical High Schools 2. Japanese side <ol style="list-style-type: none"> a. Japan Embassy b. JICA Turkey Office c. JICA Final Evaluation Mission d. State Planning Organization e. JICA Project Office

PROJECT TITLE: THE PROJECT ON ESTABLISHMENT OF INDUSTRIAL AUTOMATION TECHNOLOGIES DEPARTMENTS IN ANATOLIAN TECHNICAL HIGH SCHOOLS

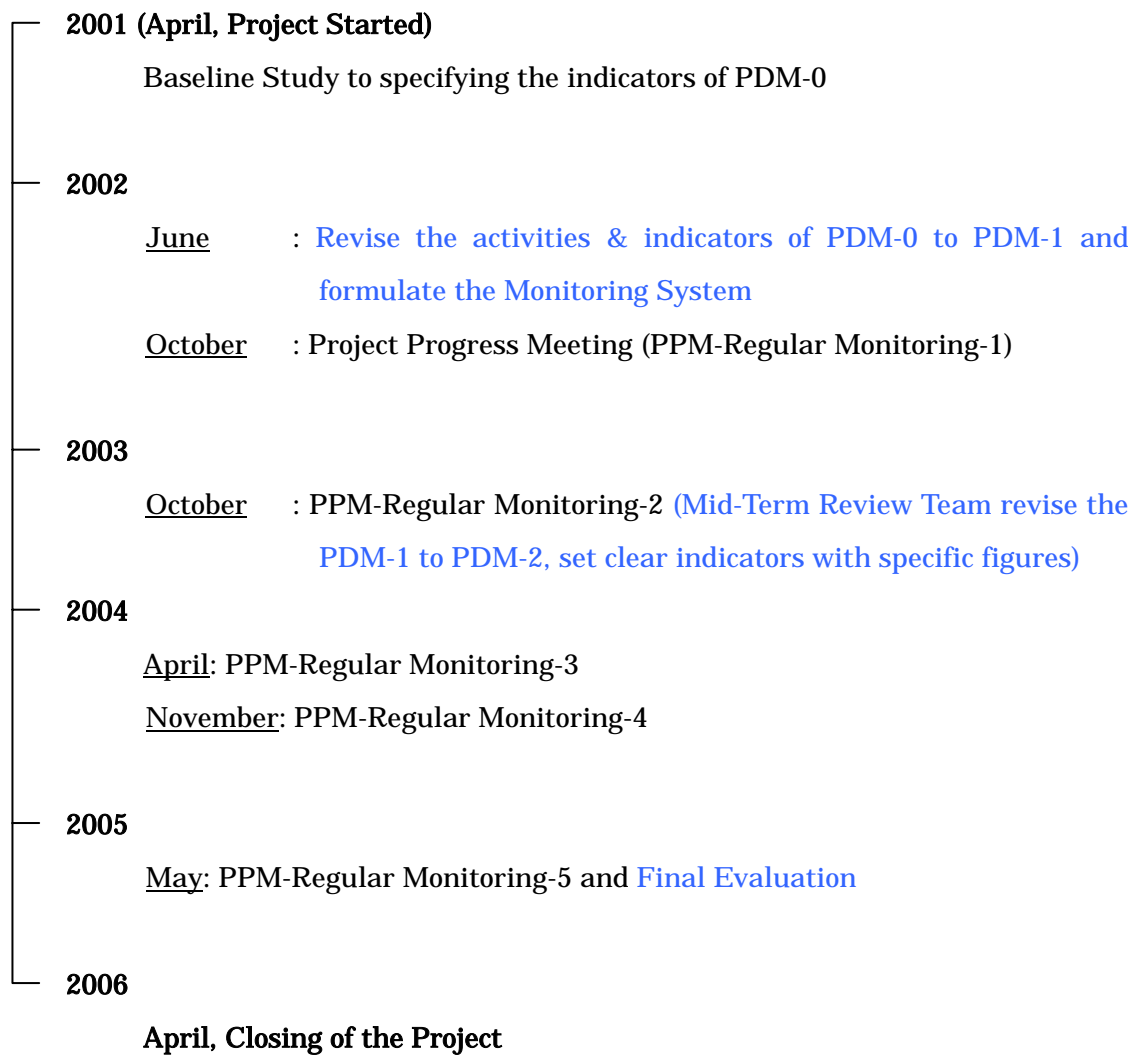
OUTPUTS/ACTIVITIES	1st Year				2nd Year				3rd Year				4th Year				5th Year				
	2001				2002				2003				2004				2005				2006
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I
1. Development of an innovative curriculum.																					
1-1. Formulation of curriculum																					
1-2. Drawing up of syllabuses																					
1-3. Understanding the industry's attitude to the curriculum																					
2. Development of suitable materials.																					
2-1. Production of Textbooks (Trial Version)																					
2-2. Production of textbooks (First Version)																					
2-3. Production of practice textbooks																					
2-4. Preparation and production of appliances for experiments and practices																					
3. Development of suitable teaching materials.																					
3-1. Production of teacher's manual																					
4. Establishment of a training system for teachers (including teaching methods) and improvement of teachers' capabilities.																					
4-1. Technology transfer of related subjects and it's teaching methods																					
5. Introduction of suitable equipment to meet the requirements of industry.																					
5-1. Drawing up of list of equipment																					
5-2. Procurement and installation of equipment																					
5-3. Understanding the industry's attitude to the above equipment																					
6. Proper operation and maintenance of the equipment mentioned above.																					
6-1. Technology transfer related to the correct usage and maintenance of equipment																					
7. Outputs I.- 6. above are disseminated to the public, other schools and industries via the Internet.																					
7-1. Convert the above outputs to digital data which are suitable for Web page																					
7-2. Making of project Web page site and upload the digital data																					
8. Establishment of a new system for industrial automation technologies departments in Anatolian technical high schools that meets the needs of industry, and creation of an extension system.																					
8-1. Understanding of the automation technology needs of industry																					
8-2. Implementation of seminars aimed at introducing the new educational to enterprises																					
8-3. Implementation of seminars on new technology and teaching method to other school teachers																					

I : April-June II : July-September III : October-December IV : January-March

..... Plan
 — Execution

**(9) Implementation of the Monitoring and Changes of PDM
(From April 2001 to April 2006)**

PDM の変遷



(10) 2004 Summer Holiday Students Factory Training Records 工場実習

İZMİR

Factory Name	Grade	Number of students, having training in factories		
		Electronics	Machinery	Total
Eldor Electronics	10	3	3	6
Drinler Machine Ind.	10	3	3	6
Hipokrat	10	3	2	5
Bak Package Ind.	10	2	4	6
Smart Machine Ind.	10	3	4	7
Viking Paper Ind.	10	2	-	2
ZF Lemförder	10	1	1	2
Ege Ceramic Ind.	10	1	1	2
DYO (Dye Ind.)	10	2	-	2
Faz Electricity	10	2	-	2
Petkim Oil and Chemical Ind.	10	1	-	1
Şimşek Package Ind.	10	1	-	1
Türksever Automotive	10	-	1	1
TOTAL				43

2005 Summer Holiday Students Factory Training Records 工場実習

İZMİR

Factory Name	Grade	Number of students, having training in factories		
		Electronics	Machinery	Total
Vestel (Refrigerator)	10	1	-	1
	11	-	-	
3E Ekmekçibaşı Electronics	10	1	-	1
	11	-	-	
Analiz Industrial Products	10	-	2	2
	11	-	-	
Arçelik	10	1	-	1
	11	-	-	
Aydın Trafo Electricity	10	1	-	3
	11	2	-	
Bak Package Ind.	10	1	-	1
	11	-	-	
Beko Electronics	10	1	-	1
	11	-	-	
BMC	10	-	6	7
	11	1	-	
Cevher Döküm (Casting) – Bornova	10	3	-	3
	11	-	-	
Cevher Döküm (Casting) – Çiğli	10	1	-	5
	11	3	1	
Cevher Jant (Rim)	10	1	1	4
	11	2	-	
CMS Rim and Machine ind.	10	-	-	1
	11	1	-	
Çukurova Chemical Ind.	10	-	1	2
	11	-	1	
Drinler Group	10	2	1	5
	11	1	1	
DYO (Dye Ind)	11	2	-	2

Factory Name	Grade	Number of students, having training in factories		
		Electronics	Machinery	Total
Ecem Automative	10	-	1	2
	11	-	1	
Efe Industry	10	3	1	10
	11	3	3	
Ege Steel Industry	10	1	-	1
	11	-	-	
Ege Fren (Break) Ind.	10	-	-	1
	11	-	1	
Egesim Automatic Control and Computer Systems	10	-	-	1
	11	-	1	
Eldor Electronics	10	-	-	1
	11	-	1	
Enerkon Aero	10	1	1	8
	11	5	1	
Ford Automative Ind.	10	2	-	2
	11	-	-	
Günkol Solar Energy and Air Conditioner	10	2	-	2
	11	-	-	
Hipokrat	10	-	1	2
	11	-	1	
Honda	10	2	-	2
	11	-	-	
Klimasan (Airconditioners)	10	1	-	1
	11	-	-	
Metod Moulding Ind.	10	-	1	1
	11	-	-	
Oprak Furniture – Construction Ind.	10	-	-	1
	11	1	-	
Petkim Oil and Chemical Ind.	10	-	1	2
	11	1	-	
Samteks Machine Ind.	10	-	-	1
	11	1	-	
Smart Machine Ind.	10	1	-	6
	11	-	5	
Star Industrial Electr. Construction	10	-	-	1
	11	-	1	

Factory Name	Grade	Number of students, having training in factories		
		Electronics	Machinery	Total
Şimşek Package Ind.	10	1	-	2
	11	1	-	
Tamsa Wall Tiling Ind.	10	-	-	1
	11	1	-	
Teknik Waterspout and Pipe Ind.	10	-	-	1
	11	-	1	
Telemetri Elektronik Systems	10	-	-	1
	11	1	-	
Tofaş Automative	10	-	-1	1
	11	-		
Tüpraş (Gas and Oil Ind.)	10	-	-	1
	11	-	1	
Türk Telekom	10	-	-1	1
	11	-		
Vestel Electronics	10	-	3	5
	11	1	1	
TOTAL 10th Grade				47
TOTAL 11th Grade				50
TOTAL				97

2004 Summer Holiday Students Factory Training Records 工場実習

KONYA

Factory Name	Grade	Number of students, having training in factories
		Electronics
Bilfar Holding	10	6
Municipality Signalization	10	2
Cement Factory	10	2
Kontensan	10	2
Endüstriyel Elektrik (Industrial Electricity)	10	2
Honda	10	2
İmaş	10	2
Krom Magnezit	10	2
Medikal 2000	10	2
Molino	10	1
Selva Food Ind.	10	2
Toyota	10	1
Yazaki	10	2
Zade	10	1

2005 Summer Holiday Students Factory Training Records 工場実習

KONYA

Factory Name	Grade	Number of students, having training in factories	
		Electronics	TOTAL
Kopaş Cosmetics	10	5	6
	11	1	
Mepsan	10	1	2
	11	1	
Honda	10	1	2
	11	1	
Medical 2000	10	2	4
	11	2	
Tetik Sübap (Valve)	10	1	2
	11	1	
Industrial Electricity	10	3	3
	11	-	
Zade	10	1	2
	11	1	
Cement Factory	10	2	4
	11	2	
Tümosan	10	3	7
	11	4	
Mercedes	10	1	2
	11	1	
Konaltaş	10	2	6
	11	4	
Kontensan	10	3	4
	11	1	
İmaş	10	1	2
	11	1	
Selva Food Ind.	10	2	4
	11	2	
Ak Aluminium	10	2	6
	11	4	
Tofaş Automative	10	-	1
	11	1	
Ford Atomative Ind.	10	-	2
	11	2	
TOTAL			59

PROJECT DESIGN MATRIX-1

Project Title: The Project on Establishment of Industrial Automation Technologies Departments in Anatolian Technical High Schools

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Ultimate Goal</p> <p>To fill the demand for mid-level technicians and engineers in the industrial automation technology field in the Republic of Turkey.</p>	<p>After 10 years of the project completion, the number of graduates of Industrial Automation Technologies Departments in Anatolian Technical High Schools becomes 360 or more every year</p>	<p>Data from the Ministry of National Education</p>	
<p>Overall Goal</p> <p>To introduce a new educational system for industrial automation technology for other Anatolian Technical High Schools.</p>	<ol style="list-style-type: none"> 1. Degree of which schools to implement the new educational system has been selected 2. After 3 to 5 years of the project completion, the number of Industrial Automation Technologies Departments in Anatolian Technical High Schools becomes more than 4 	<ol style="list-style-type: none"> 1. Data from the Ministry of National Education 2. Data from the Ministry of National Education 	<ol style="list-style-type: none"> 1. Enterprises continue to require technicians trained in automation technology.
<p>Project Purpose</p> <p>To establish a new educational system as an extension model in the Izmir and Konya Anatolian Technical High Schools in order to train mid-level technicians that will meet the requirements of industries utilizing automation technology.</p>	<ol style="list-style-type: none"> 1. Ministry of National Education announces the introduction of the new educational system. 2. The number of enterprise that hopes to employ the graduates exceeds over 40 in Izmir and 20 in Konya. 3. Number of applicants to Izmir Mazhar Zorlu and Konya Adil Karaagac ATHSs 4. Entrance examination scores of successful applicants to both schools 	<ol style="list-style-type: none"> 1. Data from the Ministry of National Education 2. Questionnaires distributed to enterprises 3. Data from the Izmir Mazhar Zorlu and Konya Adil Karaagac ATHSs 4. Data from the Izmir Mazhar Zorlu and Konya Adil Karaagac ATHSs 	<ol style="list-style-type: none"> 1. The needs of enterprises for technicians trained in automation technology do not change significantly. 2. The project continues to receive the support of the Ministry of National Education. 3. Teachers that have received training do not enter private employment. 4. Continuous funding of the project is secured

PROJECT DESIGN MATRIX-1

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Outputs</p> <ol style="list-style-type: none"> 1. Development of an innovative curriculum. 2. Development of suitable learning materials. 3. Development of suitable teaching materials. 4. Establishment of a training system for teachers (including teaching methods) and improvement of teachers' capabilities. 5. Introduction of suitable equipment to meet the requirements of industry. 6. Proper operation and maintenance of the equipment mentioned above. 7. Outputs 1.- 6. above are disseminated to the public, other schools and industries via the Internet. 8. Establishment of a new system for industrial automation technologies departments in Anatolian technical high schools that meets the needs of industry, and creation of an extension system. 	<ol style="list-style-type: none"> 1-1. Curriculum is developed by October 2001 1-2. The project team is prepared the syllabus of the new departments subjects by May every year 1-3. Degree of satisfaction which related industries have for the curriculum 2-1. The project team prepares textbooks (Trial Versions) by August every year 2-2. By May, following year of above 2-1, Trial Versions are revised and First Editions are prepared by the Project 2-3. The project team prepares equipment for experiment and practice by August every year 3-1. The project team prepares Teachers Manual (Annual Plan and Instruction Outline) by August every year 3-2. The project team prepares Teachers Manual (Instruction Manual for practice) by August every year 4. On the year of the concerned subjects start, JICA Experts carry out technology transfer of 10 hours or more (technical guidance and teaching method guidance) against more than 2 Counterparts 5-1. Degree of satisfaction of enterprises for level of equipment supplied 5-2. Equipment is installed 3 months before the concerned subjects start 6. For the newly introduced equipment to Izmir Mazhar Zorlu and Konya Adil Karaagac ATHSs, JICA Experts carry out technology transfer (related to proper usage and maintenance) against more than 2 Counterparts 7-1. Degree to which conversion has been completed (curriculum, syllabus, learning materials, teaching materials, training system) 7-2. Percentage of electronic media deployed to the public, other schools and industries 8-1. Surveys of the needs of enterprises are conducted more than once per year 8-2. At least 1 extension seminar for the new educational system (directed at enterprises) is held before students are graduated 8-3. At least 4 extension technical seminars for other schools teachers are implemented 8-4. The number of participants to the above-mentioned seminar exceeds 300 	<ol style="list-style-type: none"> 1-1. Records of project activities 1-2. Records of project activities 1-3. Questionnaires distributed to related enterprises 2-1. Records of project activities 2-2. Records of project activities 2-3. Records of project activities 3-1. Records of project activities 3-2. Records of project activities 4. Records of project activities 5-1. Interviews of related enterprises 5-2. Equipment purchase plan 6. Records of project activities 7-1. Records of project activities 7-2. Records of survey of amount of information made available on the Internet 8-1. Questionnaires distributed to related enterprises 8-2. Records of project activities 8-3. Records of project activities 8-4. Records of project activities 	<ol style="list-style-type: none"> 1. The needs of enterprises for technicians trained in automation technology do not change significantly from those assessed by the needs survey.

