Empowering Girls Through STEM Role Models: A Cross-Curricular Lesson Plan Inspired by Melike's Story

1 – GENERAL INFORMATION

Lesson Title:
"Dream It, Chase It: Melike's Inspiring Journey in Technology"
(Alternative: "Coding Dreams, Shaping Futures!")

Teacher's Name:
[To be filled in by the implementing teacher – name, institution, and country]

Target Group:
Girls aged 13–15 – lower secondary or preparatory high school level
(Interest areas: technology, computers, career guidance, female representation)

Subject(s):
• ICT / Computer Science
• Guidance / Career Planning
• English (supportive content – for the transcript and video)

Duration:
2 consecutive lesson hours (40 + 40 minutes) – including warm-up, video analysis, discussion, and creative reflection tasks

Lesson Date:
[To be determined by the implementing teacher]

Materials/Tools:
• Interview video with Melike (**TR with EN subtitles**)
• Selected **authentic** quotes from the interview (examples):
  – "I have been very good with technology since I was little."
  – "In software, we create things from scratch… it's incredibly rewarding to see people using what we've made."
  – "You should not be afraid of mathematics… everything we do progresses logically."
• Projector or screen
• Post-it notes, A4 paper, pens
• Student reflection/evaluation cards

References:
• CodingGirls WP3 Guidelines
• Melike's Interview (Transcript + Milestones)
• "Women in Code" Living Book — Melike's Story draft
• CodingGirls Lesson Plan Template (Coordinator Format)

2. LEARNING OBJECTIVES

By the end of the lesson, students will:

- Recognize the importance of role models by exploring Melike's story and identifying qualities such as resilience, curiosity, and determination.
- Reflect on their own aspirations and interests in science, technology, and creative fields, inspired by Melike's educational and career path.
- Develop basic skills in storytelling and digital expression by summarizing or representing Melike's story through posters, mind maps, or short written texts.
- Increase their awareness of gender-related challenges in STEM fields and discuss ways to overcome these challenges collectively.
- Strengthen their English listening and reading comprehension through guided interaction with selected video segments and transcripts.
- Collaborate in small groups to produce a simple and creative output (e.g., a quote poster or mind map) based on Melike's story, enhancing teamwork and shared reflection without increasing workload.

3. KEYWORDS & THEMES

Keywords

• Melike Aka Kırcal
• Women in Software Engineering
• Computer Engineering (Kocaeli University)
• Banking IT & Digital Services
• Software Architecture & Mentoring
• Mathematics & Logic in Coding
• Learning to Code at University / Early Challenges
• Teamwork & Teacher Support
• Female Manager as Mentor / Role Model
• Gender Equality & Role-Model Aim

Themes

1. **From Education to Industry in Software**
   o From high-school interest in math to Computer Engineering at KOU, then into Banking IT.
2. **Learning to Code & Early Challenges**
   o First exposure to programming at university; initial difficulty and catching up through effort.
3. **Teamwork, Teacher Support, and Growth**
   o Group projects and teacher support as catalysts for resilience and skill-building.

4. **Mentorship & Female Leadership**
   o A supportive female manager shaping confidence and professional growth.
5. **Mathematics & Logical Thinking in Coding**
   o "Don't fear mathematics; logic drives software." Class link to algorithmic thinking.
6. **Building for People: Social Impact of Software**
   o Creating software used in mobile/internet banking; seeing real users is rewarding.
7. **Software Architecture & Peer Support**
   o Designing system architecture; guiding juniors and fostering a helping culture.
8. **Gender Equality & Role Models**
   o Aspiration to be a role model for girls in tech; promoting equal opportunities.

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4. STEP-BY-STEP TEACHING PROCEDURE

Duration: 2 × 40 minutes
Approach: Using Melike's 7 milestones as a role-model story to move from inspiration to concrete action.
Materials:
• Melike's interview video (TR audio with EN subtitles)
• All 7 milestone sections + interview transcript
• Melike's page from the "Living Women in Code" booklet
• Projector or screen; Post-its, A4 paper, pens
• (Optional) Flowchart/pseudocode mini-template, reflection/exit cards

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LESSON 1 — Discovering Melike's Journey (40 Minutes)

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1) Warm-Up & Motivation (5 min)
Write on the board: İzmit – Mathematics – First Coding at University – Teamwork – Female Mentor – Banking IT – Software Architecture – Logic – Impact
Ask:
• "When something feels difficult at school, what helps you keep going?"
Mini-task: Write 3 words that feed your perseverance.

2) Introduction to Melike's Story (3 min)
Sample teacher talk:
"Today we'll explore Melike's path—from a math-loving student to a software architect in Banking IT. We'll see how teamwork, mentorship, and logical thinking shaped her journey."

3) Video Viewing & Milestone Sprint (27 min total; M1–M7)
For each milestone: (a) short viewing/summary (b) 1–2 quick questions (c) mini task/activity.

M1 – Personal Introduction (00:00–00:15) | 2 min Q: “Describe Melike in one sentence.” Mini-task: Introduce yourself in one sentence (name + one strength).
M2 – Educational Journey (00:15–00:51) | 4 min Q: “Why might math/logic attract someone to Computer Engineering?” Activity: **Decision Snapshot** — note 2 reasons to choose CE + 1 curiosity question you’d ask Melike about university.
M3 – University Challenges & Learning (00:51–01:16) | 4 min Q: “What’s one effective way to ask for help in a team project?” Mini-task: **Help Map** — write one “ask” (what support you need) and one “offer” (how you can help peers).
M4 – Career Beginnings & Mentorship (01:06–01:35) | 4 min Q: “What does a mentor do? Who could be your mentor this term?” Activity: **Support Web** — put yourself in the center; add 4 nodes (teacher/peer/family/online community).
M5 – Understanding Banking IT & Impact (01:36–02:11) | 4 min Q: “Why is building tools for real users motivating?” Mini-task: **User Journey** — pick one daily digital task (e.g., checking balance) and sketch 4 steps a user takes.
M6 – Software Architect Role (02:12–02:45) | 4 min Q: “What does ‘architecture’ mean in software?” Mini-task: **Layers Sketch** — draw a simple 3-layer diagram (UI–Logic–Data) and write one sentence per layer.

4) Exit Ticket (5 min)
Board prompt: “Today I learned from Melike that …”
Each student writes 1 sentence and hands it in.

LESSON 2 — Reflect, Express, and Create (40 Minutes)

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1) Quick Recap (3 min)
Board: Perseverance – Teamwork – Mentorship – Logic – Impact
3–4 volunteers share one takeaway from Lesson 1.

2) Workshop 1: “My Resilience Roadmap” (12 min)
Materials: Transcript, booklet page, A3 paper, pens.
Include:
• Starting point (my current strengths)
• Skills to learn (logic/coding/English, etc.)
• Obstacles & solutions (link to M3 strategies)
• Support network (from M4 Support Web)
• First step (one small action this week)

3) Workshop 2: “My 14-Day Logic/Coding Micro-Sprint” (10 min)
Plan a micro-skill (10–15 min/day): e.g., 5 warm-up logic puzzles/week, 3 tiny flowcharts, 2 pseudocode drills.
Add check boxes and a simple progress tracker.

4) Workshop 3: "Design for Users – Mini Feature" (8 min)
Task: Design a tiny improvement for a school app or class workflow.
• Goal (1 sentence) • 3 feasible steps • 1 simple metric of success.

5) Sharing & Peer Feedback (5 min)
Groups present in 60–90 seconds. Listeners give "+" (strength) and " 💡 " (one idea to improve).

6) Closing & Commitment Card (2 min)
Complete: "When I face a tough topic, I will apply this step I learned from Melike: …"
Teacher's closing: "A path in tech grows with logic, support, and practice—just like Melike's."

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5. CROSS-CURRICULAR INTEGRATION

1. **Computer Science & STEM Awareness**
   Melike'nin "matematik ve mantık" vurgusu, algoritmik düşünme ve temel programlama kavramlarına doğal bir giriş sağlar. Sınıfta basit akış şeması/pseudocode yazımı (örn. "okula hazırlanma" sürecini 6–8 adımda tanımlama) ve **UI–Logic–Data** katmanlarını tanıtan mini eskizler yapılabilir.

2. **Technology and Engineering**
   Bankacılık BT bağlamında "kullanıcıların gerçek hayatta kullandığı yazılımlar" fikri, küçük özellik tasarımları ve yinelemeli geliştirme döngülerine (tasarla–deneme–iyileştir) bağlanır. Öğrenciler, okul yaşamını iyileştirecek **3 adımlık mini-özellik** fikri tasarlar (hedef–adımlar–başarı ölçütü).

3. **Social Studies / Citizenship Education**
   Hikâyedeki **mentorluk, ekip çalışması ve destek ağları** (öğretmen/akran/aile) toplumsal dayanışma ve vatandaşlık konularıyla ilişkilendirilir. Etkinlik: "**Support Web**" — öğrenciler merkezde kendilerini konumlandırıp dört destek kaynağını haritalar; saygı, iş birliği ve dijital vatandaşlık ilkeleri tartışılır.

4. **Guidance and Career Development**
   Üniversitede kodlamaya ilk kez başlama, ilk iş ve kadın yönetici/mentordan ilham alma temaları; **yardım isteme–yardım verme** davranışları, hedef koyma ve mikro-adım planlamasıyla bütünleşir. Etkinlik: "**14-Day Micro-Sprint**" — günlük 10–15 dakikalık mantık/algoritma alıştırmaları için basit bir kontrol listesi.

5. **Gender Equality Education**
   Erkek egemen görülen alanlarda **eşit fırsatlar** ve **rol model** etkisi tartışılır. Sınıf/school düzeyinde uygulanabilir adımlar belirlenir: mentorluk eşleşmeleri, görünür kadın rol modeller, kapsayıcı dil ve yapıcı geri bildirim kuralları.

6. **English as a Foreign Language**
   Video **Türkçe ses + İngilizce altyazı** ve transkript ile dinleme/okuma için özgün materyal sunar. Öğrenciler iki kısa bölümden **3 özgün alıntı/ifade** çıkarır, bunu kendi cümleleriyle **parafraz** eder ve mini sözlük oluşturur.

7. **First Language Education (Turkish)**
   Yaratıcı yazma ve öz ifade çalışmaları: "**Ben Melike olsam…**", "**Benim STEM Yolculuğum**", "**Geçmişteki bana tavsiye**". Bu çalışmalar anlatı kurgusu, duygu/düşünceyi yapılandırma ve hikâye anlatımı becerilerini güçlendirir.

6. EVALUATION CRITERIA

This section proposes formative, inclusive, student-centered assessment, focusing on curiosity, resilience, and inspiration drawn from **Melike's** journey. The aim is to support personal growth and meaningful learning rather than competition or grades.

Evaluation Table

Skill Area	Assessment Tool / Strategy
Emotional Reflection	Exit Ticket: "Today I learned from Melike that …". Volunteers may share aloud to foster empathy and collective inspiration.
Creative Thinking & Expression	Product Observation: Look for originality, symbolism, and personal connection in outputs tied to milestones: Decision Snapshot (M2), Help Map (M3), Support Web (M4), User Journey (M5), Layers Sketch UI–Logic–Data (M6), Algorithm Bite pseudocode (M7). Focus on ideas/meaning—not artistic perfection.
Engagement & Participation	Observation Checklist: Informal tracking of active involvement during warm-up, milestone Q&As, mini-tasks, and group work; respectful peer feedback; attention and time management.
Empathy & Perspective-Taking	"If I were Melike …" short write-up: Students imagine her experiences (e.g., starting coding at university, learning with support, mentorship) and propose constructive responses/attitudes.
Communication & Sharing Skills	Lightning Presentations (60–90 sec): Share Resilience Roadmap and Design for Users – Mini Feature (Lesson 2). Evaluate clarity of message, timing, and respectful listening.
Algorithmic Thinking & CS Foundations	Micro-Artifacts Review: Check Algorithm Bite (M7) for clear, ordered steps (6–8), simple logic; and Layers Sketch (M6) for correct mapping of UI / Logic / Data with one-sentence roles.
Goal Setting & Self-Awareness	14-Day Logic/Coding Micro-Sprint Plan: Feasibility of daily micro-steps (10–15 min), realistic resources, simple progress check boxes; plus a Commitment Card: "When I face a tough topic, I will apply this step I learned from Melike: …".
English Listening/Reading (Optional)	Quote Extraction & Paraphrase: From 2 short video segments (TR audio + EN subtitles), students extract 3 authentic quotes/phrases and paraphrase in their own words; build a mini-glossary (3–5 items). Focus on comprehension, not grammar perfection.

Notes for Teachers

- Value **connection, creativity, and self-expression**; prioritize **progress over perfection**.
- Keep feedback **supportive and non-judgmental**—each learner's path is unique.
- Apply strategies via quick 1:1 check-ins, peer feedback, and brief whole-class reflections.
- Reward **participation and safe help-seeking** (M3–M4), and highlight the role of **supportive environments and mentorship** throughout.

7. RESOURCES AND MATERIALS (Extensions & Enrichment)

These enrichment activities extend learning beyond the classroom, strengthen real-world connections, and encourage interdisciplinary engagement. Teachers may select any options based on time, context, and student interest.

1. **"Women in Software" Poster Exhibition**
   Objective: Introduce inspiring women in software/computer engineering and expand role-model awareness.
   Activity: Each student prepares an A3 poster about a local or international woman in software (photo if possible, field, one quote/achievement). Melike's themes—logic, perseverance, mentorship—may be highlighted.
   Extension: Display a "Women in Software Gallery" in corridors; invite families/staff.
   Pedagogical Value: Research, visual presentation, understanding non-linear career paths.

2. **Mentorship & Support Web + Outreach Message**
   Objective: Turn Melike's mentor experience into practical help-seeking skills.
   Activity: Students map a **Support Web** (teacher/peer/family/online community) and draft a 3-question **mentor-outreach message** (polite intro, specific ask, next step).
   Extension: Pair with the guidance office to pilot a simple mentorship hour.
   Pedagogical Value: Psychological safety, help-seeking/giving culture, communication.

3. **"Design a Mini Feature" — UI–Logic–Data (Paper Prototype or Blocks)**
   Objective: Practice product thinking and basic architecture inspired by Melike's role.
   Activity: Choose a small school workflow to improve; sketch a 3-layer diagram (**UI–Logic–Data**) and a 3-step flow (input–process–output) as paper prototype or short block-based flow.
   Extension: Mini posters on the **social impact of software**.
   Pedagogical Value: Computational thinking, abstraction, impact-oriented design.

4. **Teamwork Lab: Pair-Programming & Help Map**
   Objective: Build the teamwork habits Melike used to overcome early coding struggles.
   Activity: 12-minute pair-programming simulation on a logic puzzle; each student updates a **Help Map** (one "ask", one "offer").
   Extension: Class charter for constructive feedback and respectful collaboration.
   Pedagogical Value: Collaboration, metacognition, constructive peer feedback.

5. **Language & Logic Growth Pack: 14-Day Micro-Sprint + "Letter to Melike"**
   Objective: Establish sustainable micro-learning habits in logic/coding and reflective writing.
   Activity: Plan a **14-day micro-sprint** (10–15 min/day; e.g., 5 logic warm-ups/week, 3 tiny flowcharts, 2 pseudocode drills). Write a short **Letter to Melike** (TR or EN) about what inspired them and their sprint goal.
   Extension: Class wall to track progress with simple check boxes.
   Pedagogical Value: Self-regulation, motivation, written expression, empathy.

6. **Community Collaboration: Women & Technology Day**
   Objective: Amplify student voice and connect with local networks.
   Activity: Host a school event with women-focused NGOs or community centers. Students showcase role-model posters, **Support Webs**, **Layers Sketches**, and mini-feature ideas.
   Extension: 20-minute online Q&A with a woman software engineer.
   Pedagogical Value: Social awareness, networking, authentic audience for student work.

Note: Prepare digital/print materials in advance (video link, transcript, templates for Support Web, 14-Day Sprint, UI–Logic–Data sketch) and make them accessible before the lesson.

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8. SUPPORTING MATERIALS AND RESOURCES

This section lists only the essential materials and resources needed to implement the lesson effectively. All key educational tools will be provided through the project's digital platform. No specialized or hard-to-access materials are required.

Digital Materials Provided by the Project

Resource	Description
Melike's Story Video	Short classroom edit (**TR audio + EN subtitles**) with **M1–M7 milestone timestamps** for easy pausing/segmenting.
PDF Transcript	Full transcript for close reading or **video-free** delivery.
Lesson Plan Document	This complete teaching guide, including step-by-step procedures, activity templates, and pedagogical notes.
Digital Platform Access	All resources will be hosted on a project platform (e.g., Living Libraries / CodingGirl Educational Portal), with login instructions provided. Teachers will download and print the needed worksheets.
Printable Templates	- Dream Map - STEM Story Panels - Exit Ticket ("When I grow up, I want to be… because…") - Reflection Card ("The most important thing I learned from Melike was…")

Basic Stationery (Typically Available in Schools)

These are low-cost and widely accessible materials that support creative expression:

- A4 or A3 white paper
- Pencils and erasers
- Colored pencils or crayons
- Rulers, scissors, glue sticks
- Sticky notes or small cards (optional)

Accessibility Recommendations

- Print transcripts in large font if needed.
- Allow oral sharing instead of written tasks where appropriate.
- If video cannot be shown, use the transcript with guided reading questions.

Note to Teachers:
No external apps or paid tools are required. This lesson is designed to work **offline** if needed, using only the resources **provided by the project** and materials **already available in schools**.