Colour Scene Investigation: Colour Communication in Fashion and Textile Design.

Tutor’s Notes

These notes are designed to assist delivery of the Colour Scene Investigation. They link to the workbook, presentation and other resources. Tutors delivering the workshop are encouraged to use these, and other resources, as necessary in the light of work in their own establishments to complement the ability and academic foci of the students concerned.

Background.

Describing colour is extremely difficult, if you have ever tried to accurately describe a colour to someone then you will know just how hard it is.

Clear and accurate colour communication is essential, so we need an effective way of describing colours. Most systems agree on three attributes of colour, but the names for these attributes vary from one industry to the next. The most recognised method for describing colour is the Munsell system which uses the terms hue, value and chroma.

This workshop is tailored to make students think about designs in the context of how promoting colour constancy with minimal environmental impact.

Students will consider the concept of colour communication from a variety of standpoints:

1. Appreciation of the difficulty of describing a colour without using similes such as, ‘It is like that coat I bought last week but darker’, for example.
2. Using, and developing an understanding of, the technical terminology around colour communication.
3. Identification of fibre types, their properties and the consequent dyes / dyeing processes required and begin to understand how these factors work together to facilitate accurate colour communication, and so colour constancy, internationally.
4. Evaluate how accurate colour communication affects the environmental impact of a product in production and end use.

Resources.

1. Tutor notes – containing answer sheets.
2. Session plan.
3. Course video.
4. Downloadable transcripts of the fibre and dye videos.
5. Workbook to be should downloaded and copied for students prior to the session.

Additional resources to be provided in house.

1. Presentation equipment.
2. Flip chart and pens if desired.
3. Samples of cotton, polyester and nylon.
Points for Session Delivery

1. Give out workbooks.
2. Follow the session plan which is quite comprehensive.
3. Initially allow students approximately 2 minutes to attempt describing a colour to someone else. Feedback can be taken at this or any time during the workshop depending on student ability, tutor preference and/or time available. The video is designed to be paused for small group discussion and completion of the appropriate workbook sections as the course progresses.
4. Answers may be projected after completion of each video section for formative assessment.
5. The questions on pages 4-8 of the workbook are intended as a guide to student progress through the investigation. More capable students are encouraged to explore the vocabulary further than merely ‘hue’, ‘value’ and ‘chroma’; they may also be able to assist the learning of students who find the work less accessible.
6. Group discussion should be particularly encouraged after the Sustainability video (3.0) as students are asked to develop their learning by sharing their own ideas about how effective colour communication can reduce the negative environmental impact of the textile industry.
7. Timely tutor feedback is useful both during and at the end of the session.
8. At the end of the session students should be encouraged to immediately reflect on the learning outcomes and skills developed by completing Table 1 in the workbook. They should then further reflect, after the session, completing Table 2. Both tables are on p12 and are adapted from Slides 13 and 14 of the presentation respectively. They are also given overleaf, along with an exemplar, information required for Table 2:
1.0 Colour Communication: Video Answers.

1. What is the most recognised system for describing colour?
   The Munsell System.

2. What are the 3 terms that this system uses to communicate colour?
   Hue.
   Value.
   Chroma.

3. Describe the meaning of ‘hue’.
   The basic colour.

4. Describe the meaning of ‘value’.
   The lightness of the colour (adding black or white, in paint terms).

5. Describe the meaning of ‘chroma’.
   The intensity or saturation of the colour.

6. Name 2 other systems which are used to communicate colour.
   CIELAB and NCS Colour Space

7. What is the RGB colour system used for and what are the primary colours?
   This is used for on-screen colours.
   The primary colours are Red, Green and Blue.

8. What is the CMYK colour system used for and what are the primary colours?
   This is used for printed colours.
   The primary colours are Cyan, Magenta, Yellow.

9. Name the graphical image used to give us a visual illustration of a colour.
   Reflectance curves.
2.0 Sustainability: Video Answers.

1. Name 3 types of sustainability?
   - Social
   - Financial
   - Environmental

2. Give 4 key factors involved in environmental sustainability in the textile industry.
   - Sourcing and production of chemicals.
   - Energy and water use in production.
   - Treatment of waste.
   - Transportation – the distance travelled and the method.
   - The energy, chemical and water use during the life of a garment.
   - Product disposal at the end of its life.

3. What is meant by social sustainability?
   - A company caring for its workforce and rewarding them appropriately.

4. What is meant by financial sustainability?
   - The company being able to continue manufacturing and making a positive impact in future years.

5. In groups, discuss ways in which you might reduce the environmental impact of the textile industry.
   - Note your shared ideas below.
   - Student independent input.
6. From which part of the plant is cotton obtained?
   The seed

7. What does the process of ‘scouring’ remove from the seed?
   The waxy cuticle.

8. What type of dyes does scouring allow to be used on cotton?
   Water soluble.

9. What type of fibres make up cotton?
   Cellulose.

10. What are the basic building blocks of cellulose?
    Glucose molecules.

11. Give 3 other examples of natural plant based fibres.
    Linen.
    Jute.
    Hemp.

12. What types of dyes can be used for cotton?
    Disperse dyes.
    Reactive dyes.
    Vat dyes.

13. What types of bonds form between reactive dyes and cotton?
    Covalent.

14. Are these bonds strong or weak and what does this mean in terms of wet fastness?
    Strong giving excellent wet fastness.

15. What are the main advantages of using reactive dyes on cotton?
    Simple to apply.
    Excellent light and wash fastness.
    A wide range of shades.

16. What is the main disadvantage of using reactive dyes on cotton?
    More expensive than other dyes.
4.0 Polyester Fibres and Disperse Dyes: Video Answers.

17. What is polyester derived from?
   Crude oil.

18. Polyester is hydrophobic: what does this mean?
   It repels water or is ‘water hating’.

19. What type of dyes are used for polyester fibres?
   Disperse dyes.

20. Give 2 examples of polyester fibres in terms of their physical characteristics?
   Hollow fibres.
   Fibres with a variety of cross sectional shapes.

21. State one use for each of the different fibres in your answer to question 4?
   Hollow fibres: trap air so are good for thermal wear.
   Various cross sectional shaped fibres: allow moisture wicking to cool the wearer so are useful for sports clothing.

22. In what form are disperse dyes added to polyester fibres.
   A fine dispersion - they are only sparingly (slightly) soluble in water.

23. Why is an extremely high temperature of up to 130°C required for this process?
   To increase the rate of diffusion of the sparingly soluble dye into the fibre.

24. What types of bonds are formed between disperse dye and polyester fibre molecules and are these bonds weak or strong?
   Van der Waal’s forces.
   Hydrogen bonds.

25. Why do disperse dyes give good wash fastness when applied to polyester?
   This is due to their hydrophobic nature so the dyes, in addition to the fibres, repel water.
5.0  Nylon and Acid Dyes: Video Answers.

26. What is nylon derived from?
   Crude oil.

27. Name the process used to extrude nylon.
   Spinning

28. What type of dyes are used for nylon fibres?
   Acid dyes.

29. Give 2 examples of nylon fibres?
   Nylon 6
   Nylon 6’6

30. Give 2 different properties of the fibres named in Question 4?
   Strong.
   Elastic.

31. Name a fibre other than nylon on which acid dyes are used.
   Wool.

32. Which chemical group on nylon fibres attracts the negatively charged (anionic) acid dyes?
   NH⁺ or amino group.

33. Name the type of bond formed between acid dyes and fibres?
   Ionic.

34. Are these bonds weak or strong and what does this mean in terms of wet fastness?
   Strong so wet fastness is good.

35. Give 4 examples of acid dyes.
   Levelling acid dyes.
   Fast acid dyes.
   Milling acid dyes
   Super-milling acid dyes.

36. Levelling acid dyes consist of small molecules. Give one advantage and one disadvantage of
   this characteristic.
   Advantage: Good migration in to the fibre giving even coloration:
   Disadvantage: Poor wash fastness.
Table 1. Revisiting the Learning Objectives and Skills.

Use a scale from 1-3 to indicate the extent to which you feel you have achieved the learning objectives where 1 is the highest.

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>Achieved</th>
<th>Skill</th>
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<tbody>
<tr>
<td></td>
<td>1 2 3</td>
<td>Acquired Used Developed</td>
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<tr>
<td>Distinguish and compare colours using the terms ‘hue’, ‘value’, and ‘chroma’.</td>
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<td>Explain how analysis of reflectance curves can assist in the production of textiles with colour constancy under a variety of light sources.</td>
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<td>Evaluate any relationship you can deduce between colour constancy and environmental impact of your product in production and end use.</td>
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<td>Communication</td>
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<td>Data Analysis</td>
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<td>Evaluation</td>
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Table 2. Structured Reflection.

<table>
<thead>
<tr>
<th>Date</th>
<th>Description of event</th>
<th>What did I learn?</th>
<th>Short term implications</th>
<th>Long term implications</th>
<th>Feedback from other students</th>
<th>What will I do differently?</th>
<th>Notes / targets</th>
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<td>Description of event</td>
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<td>What did I learn?</td>
<td>The structure and properties of natural and synthetic fibres and linked them to function.</td>
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<td>Short term implications</td>
<td>Use this information to answer the questions given at the end of the lecture.</td>
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<td>Long term implications</td>
<td>Reinforce this for the final exam.</td>
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<td>Feedback from other students</td>
<td>Several of us found that we were confused by the fact that regenerated fibres are man-made but some can also be natural: e.g. natural polymer fibres such as Viscose.</td>
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<td>What will I do differently?</td>
<td>Discuss the subject with more / other students – talking about it might help me to understand and it is sometimes nice to know that others are struggling too. Be more confident at asking questions during sessions if I’m not sure.</td>
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<td>Notes / targets</td>
<td>Read through the notes thoroughly and reinforce using the textbook and any on-line resources I can find. Think about where I come across what I have learned in my job.</td>
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