Scientific communication

Contents

Introduction

Scientific communication can utilize many channels such as written, oral, visual (PowerPoints), video, installations and prototypes or demonstrators and combinations thereof. All of them need a receiver willing to give you feedback essential for your communication skills improvement, here in a scientific context. This resource, as a communication receiver does not have that many interactive tools to give you feedback on your own original scientific messages. Instead this learning resource offers a range of scientific texts followed by study questions for you to contemplate on and compare to our reflections.

Robust scientific communication always starts with a state-of-the-art description. To create that description requires a search and analysis of the literature, i.e. a lot of reading. Hence, we believe it is worthwhile spending some time on this learning resource.

These texts are picked from an open source peer-reviewed scientific journal and from five abstracts written by examinees from our Bachelor's Textile Engineering programme. The students write their theses in Swedish but they also contain an abstract in English. By entering the link you will enjoy the journal paper that you should study and then answer a number of questions. After this section you can also access a series of Bachelor's thesis abstracts. After each abstract there are four questions to consider that you answer. After each of your answers a comment of ours will be revealed.

Journal paper

The peer reviewed journal can be found by clicking on the following link and selecting the option to 'DOWNLOAD PDF' from the top right of the page: Peer reviewed journal

Q1. What was the purpose of the paper?

Q2. Judging from the abstract – did they succeed with what they set out to do?

Q3. Why are the mechanical property alterations of the fibres, yarns and fabrics discussed in the abstract? How do they relate to the primary research question?

Q4. What is your opinion about Scanning Electron Microscopy as a qualitative and quantitative tool for surface morphological analysis?

Q5. What is their point of using wetting?

Q6. In the abstract and conclusions the authors claim to have found significant mechanical improvements of the aramid yarns (filament bundles) in terms of higher tenacity and elongation with ozone treatment. Do you a) agree about both these observations, b) also think they are significant, in statistical terms and c) have an opinion about the scatter of elongation (at break?) for the yarns accounted for in Table 3?

Q7. Do you have an idea why the ball burst strength data shown in Figure 5 seem to gain from ozone treatment?

Q8. What do you think of the way they relate their results with results from literature on similar attempts to modify the surfaces of reinforcement fibres for composites?

Q9. What additional testing would you suggest?

Abstract 1

BSc thesis abstracts are reached from the embedded hyperlinks. The English abstract follows immediately after the Swedish one.

Aronsson, J., & Björquist, S. (2015) *Nya t-shirts av gamla jeans: Textila egenskaper hos en cellulosabaserad konstfiber tillverkad av dissolvingmassa framställd från bomull av textilt avfall* (Dissertation).

QB1.1. What was the purpose of their thesis project?

QB1.2. Why do the authors think that was important?

QB1.3. Do you think the chosen methods were relevant for their research question?

QB1.4. Do you think they accomplished what they set out to do?

Abstract 2

Backe, C., & Skelte, G. (2015) *Piezoelektriska filament: från garn till textil applikation* (Dissertation).

QB2.1. What was the purpose of their thesis project?

QB2.2. How was the yarn incorporated in textile applications?

QB2.3. How did the yarn react to moisture?

QB2.4. In what application was the concept evaluated?

Abstract 3

Larsson, M., & Nilsson, A. (2015) *Förädling av stjälkfibrer för fler naturliga fiberalternativ: Enzymbehandling för avlägsnande av pektin i stjälkfibrer för ökad spinnbarhet.* (Dissertation).

QB3.1. What was the purpose of their thesis project?

QB3.2. How did they monitor the effect of the treatment?

QB3.3. Is it possible to distinguish between the effects of the enzymes and the chelator (EDTA)?

QB3.4. Would you say that they were successful?

Abstract 4

Vasell, A., & Ronkainen, J. (2017) *Mekanisk mjukgöring av pappersgarn: En studie om smärgling av pappersgarn samt behandlingens påverkan på de taktila egenskaperna* (Dissertation).

QB4.1. What was the purpose of their thesis project?

QB4.2. How did they assess the effect of the treatment?

QB4.3. Were the Kawabata Evaluation System results conclusive?

QB4.4. Yarn tenacity dropped after the treatment. What do you think about the severity of that finding?

Abstract 5

Sjöblom, T., & Davidsson, E. (2015) *Textila ledningsbanor: En jämförande studie av konduktiva material för textila applikationer* (Dissertation).

QB5.1. What was the purpose of their thesis project?

QB5.2. What method was used to assess how well the interconnectors worked?

QB5.3. They tried the effects from coating of the yarns. Why and what came out of it?

QB5.4. Was there a best choice?

We hope you have had a chance to reflect on what was communicated. Whether they managed to get through with their message and how it could potentially have been further improved.

Answers

Journal paper

Q1. What was the purpose of the paper?

Comment: To assess whether ozone treatment of aramid fabrics could make their surface more hydrophilic (higher surface energy). If so - this would facilitate the interfacial strength of aramid based fibre reinforced composites.

Q2. Judging from the abstract – did they succeed with what they set out to do?

Comment: It is hard to tell from the abstract.

Q3. Why are the mechanical property alterations of the fibres, yarns and fabrics discussed in the abstract? How do they relate to the primary research question?

Comment: Mechanical properties are what you put at risk with their ozone treatment. Since that is what aramid fibres are used for it is essential not to jeopardize them. However, they are in no way related to the primary research question.

Q4. What is your opinion about Scanning Electron Microscopy as a qualitative and quantitative tool for surface morphological analysis?

Comment: It takes significant ethical integrity to use SEM as a research tool since you may select whatever observations that strengthens your hypothesis. The authors showed high ethical standards.

In this case the oxidation would probably have to reach an advanced stage for SEM to reveal any visible effects on the surface of the fibres. Consider the resolution of the images, which is in the order of 1 µm while an oxygen atom is below 1 nm.

Q5. What is their point of using wetting?

Comment: They use it as a means to monitor increasing hydrophilicity that should come with gradual surface oxidation from the ozone.

Q6. In the abstract and conclusions the authors claim to have found significant mechanical improvements of the aramid yarns (filament bundles) in terms of higher tenacity and

elongation with ozone treatment. Do you a) agree about both these observations, b) also think they are significant, in statistical terms and c) have an opinion about the scatter of elongation (at break?) for the yarns accounted for in Table 3?

Comment: a) the tenacity increased but the elongation actually dropped, b) there is no statistical analysis to back these statements up and c) the scatter is huge and there is no consistency with the ozone treatment time.

Q7. Do you have an idea why the ball burst strength data shown in Figure 5 seem to gain from ozone treatment?

Comment: Potentially from the increased coefficient of friction that may come with the oxidation that according to the wicking data in Fig 3 seem to be real.

Q8. What do you think of the way they relate their results with results from literature on similar attempts to modify the surfaces of reinforcement fibres for composites?

Comment: Even if they have several references that seem highly relevant there is no such attempt to reflect on them. Discussion and self-reflection is totally missing.

Q9. What additional testing would you suggest?

Comment: That the authors aim for the key question. Does the treatment improve the fibre-matrix adhesion strength in a composite? This may for instance be done by embedding single fibres in a ductile matrix and study at what lengths the fibres break at.

Abstract1

QB1.1. What was the purpose of their thesis project?

Comment: To assess the textile qualities of fibres made from regenerated dissolving pulp from recycled cotton waste.

QB1.2. Why do the authors think that was important?

Comment: Since the demand for textile fibres is rapidly increasing and there is a huge need for sustainable fibres at the same time that textile waste is an ever growing disposable issue. It's a classical win-win situation.

QB1.3. Do you think the chosen methods were relevant for their research question?

Comment: They seem very exhaustive. Mechanical characterization of the fabrics could have been relevant. In particular ball burst strength.

QB1.4. Do you think they accomplished what they set out to do?

Comment: Yes definitely. The strength for the textile waste yarn was even higher than the conventional reference yarns.

Abstract 2

QB2.1. What was the purpose of their thesis project?

Comment: To evaluate how a dielectric yarn made out of Polyvinylidene fluoride performs in simulated use.

QB2.2. How was the yarn incorporated in textile applications?

Comment: By stitching.

QB2.3. How did the yarn react to moisture?

Comment: The authors tell that the moisture and temperature affected the piezoelectric effect but their individual and/or effects are not stated nor is it stated if their effects were for the good or for the bad.

QB2.4. In what application was the concept evaluated?

Comment: In foot sensors to monitor the front and rear parts of the feet.

Abstract 3

QB3.1. What was the purpose of their thesis project?

Comment: To try to assess the applicability of a certain pectate lyase to reduce the pectin from natural fibres of Grewia optiva to refine the natural fibres to the extent that they became spinnable.

QB3.2. How did they monitor the effect of the treatment?

Comment: By weight alterations and SEM.

QB3.3. Is it possible to distinguish between the effects of the enzymes and the chelator (EDTA)?

Comment: Unfortunately there is no such discussion in the abstract.

QB3.4. Would you say that they were successful?

Comment: The natural fibres from grewia optiva could still not be spun into yarn after the treatment. Potentially because it is not a bast fibre but a wood based fibre that likely contained lignin.

Abstract 4

QB4.1. What was the purpose of their thesis project?

Comment: To investigate whether sand paper grinding of paper yarn would add comfort to denim pattern weaves.

QB4.2. How did they assess the effect of the treatment?

Comment: By Kawabata Evaluation System assessment and SEM of the weaves, tensile testing of yarn and measurements of the weave thickness.

QB4.3. Were the Kawabata Evaluation System results conclusive?

Comment: Besides compressibility of the weaves no softening could be registered by KES.

QB4.4. Yarn tenacity dropped after the treatment. What do you think about the severity of that finding?

Comment: The strength of the yarns were still a lot higher than conventional cotton yarns.

Abstract 5

QB5.1. What was the purpose of their thesis project?

Comment: To search for the most durable textile interconnections to be incorporated in fabrics and compare it with a commercial reference of already integrated interconnectors in a fabric.

QB5.2. What method was used to assess how well the interconnectors worked?

Comment: Electrical conductivity measurements.

QB5.3. They tried the effects from coating of the yarns. Why and what came out of it?

Comment: The coating preserved the conductivity of some yarns that were faced by simulated use (laundering and bending) whereas other yarns did not benefit from the coating.

QB5.4. Was there a best choice?

Comment: The commercial reference was the best – perhaps not that surprising.