Understanding of Statistics in Gephi:

1. Modularity: This was designed to measure how hard it is to divide a network into modules (like groups or communities). (different majors)

Judgment: Importance: 8/10

Reason: Modularity is like loseness centrality. Networks with high modularity have dense connections between the nodes within modules but separate with nodes in different module. It is necessary for us to understand based on same background for instance, whether it is some relation between engagement and performance. Or we can say based on same extent of engagement, whether it is some implication between background and performance.

1. Closeness centrality: This is a measure that indicates how close a node is to other nodes in the network.

Judgment: Importance: 7.5/10

Reason: High closeness centrality indicates how frequent a student contacts others, which implies the extent of engagement. It is helpful because we want to know how close a student is to others. As everyone has the right to say something in the blog, it’s helpful for us to understand how the freedom environment helps students in learning compared to traditionally-structured classes.

1. Eccentricity: This measures the distance between a node and the node that is furthest from it.

Judgment: Importance: 7/10

Reason: I think based on eccentricity, we can analysis the connection between students who have total different background. This is somehow important because we want to know how the background plays a role in students’ engagement and performance. Eccentricity could show us the contact between different background.

1. Connected Components: This determines the number of connected components in the network.

Explain: If our graph is directed, it detects both strongly and weakly connected points. If our graph is undirected, it detects only weakly connected points.

Judgment: Importance: 6.5/10

Reason: Connected components is a great algorithm to evaluate the extent of engagement. However, since most our graph are undirected, so it is not necessary enough to just see the weakly connected points.

1. Average weighted degree: the weighted degree of a node is similar with average degree. It is based on the number of edge for a node, but it is doing the sum weight of the edges.

Judgment: Importance: 6/10

Reason: Average weighted degree is helpful to show the total boundary length. We can use this statistic to apply for how much a student get involved, and then we can dig deeper for instance to find whether the length of the content that students reply is relevant to their performance.

1. Average degree: the degree of a node shows the number of edges that are adjacent to this node. Then apparently average degree shows the average number of edges that connects to each node.

Judgment: Importance: 4/10

Reason: Average degree is helpful to show the extent of how students’ usage patterns explain performance of a section or a class. However, as the database is really big, many lower frequency of usage patterns will influence the average degree, which means just using average degree is not accurate. It is still necessary to show the degree of every node since this is the most efficient way to show the engagement of every student.

1. Betweenness centrality: This measures how often a node appears on shortest paths between nodes in the network.

Judgment: Importance: 3/10

Reason: High centrality might suggest that the individual is connecting different parts of the network together. However, in our situation, for example in dynamics class, normally people contact each other directly on blog without passing others. So we won’t get much information from centrality.

1. Graph density: A complete graph’s density equals to 1. It is a graph in which every pair of nodes is connected via a direct edge. The density graph measures how close the graph is to complete.

Judgment: Importance: 3/10

Reason: It is not helpful because there are many blogs that posted without any response. Normally we will have a low density graph.

Background, performance in class (grades), engagement (using the site, posting, connect to others)